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Designing for Fluid Transitions to Sustainable Infrastructure: The Case of the Bedford & Milton Keynes Waterway

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Thesis submitted in fulfilment of the requirements for the degree of Doctor of Philosophy

September 2016

Design Group

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Abstract

The need for transitions to more sustainable socio-technical systems that underpin everyday life has never been more prescient. However, such transitions are daunting and difficult. Design initiates change in artefacts and therefore has an important role to play in transitions to more sustainable futures. Yet the power of design in assisting such transitions has not been fully realised. This thesis explores this issue.

A longitudinal case study of the Bedford & Milton Keynes Waterway infrastructure project was completed. Ethnographic observation and interviews provided empirical data on the design activities present in this nascent project.

The Fluid Transition (FT) approach was adopted as it identifies a role for design in transitions and provides guidance on how interpretative flexibility may be embraced through design to develop situationally specific solutions and realise a multiplicity of transition pathways. The FT approach was used as a theoretical lens to both analyse and practically guide design activity.

Analysing the project in light of key aspects of the FT approach showed that design activities did not sufficiently take into account the projects situated nature and the need for actor participation beyond the traditional nexus. Interventions were completed with case study actors to influence project design activities and included workshops employing visioning, co-design, as well as visual communication practices new to the project.

A framework for Fluid Design for Sustainable Transitions (FDfST) has been developed which identifies key design activities to assist socio-technical transitions. Visioning is the most powerful element of the framework, exerting influence over all others. The case study shows that the project has embarked upon a transition pathway toward a more sustainable infrastructure and design can play a key role in such transition pathways.

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Alex Rowbotham, June 2016.

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Thesis Glossary

Annual Partnership Conference (APC) – An annual conference held by the BMKW Trust bringing together professionals, volunteers and public who have an interest in the BMKW project to hear the latest news (see also Table 4.2).

A-Z, the – The short hand name for the A-Z Project Delivery Plan, a document published by the BMKW Consortium roughly every couple of years, which captures information about the infrastructure project and communicates it in a way that supports project management. The proposed BMKW route is split up into a series of sections, identified from A to Z, making focused discussions and information management easier.

Bedford & Milton Keynes Waterway (BMKW) – A proposed inland waterway infrastructure connecting the Grand Union canal at Milton Keynes with the River Ouse in Bedford, linking up an isolated arm of the national system. A new waterway, its proposed route passes under the M1 and along the Marston Vale. It is the subject for the case study of this research (often referred to as ‘the Waterway’ or ‘the project’).

Bedford Unitary Authority (Bedford LA) – The administrative organisation of local government that is officially responsible for all the public services and facilities in the borough of Bedford.

Canal – An artificial channel of water constructed for the navigation of waterborne travel or transport. The canals of the UK were constructed during the industrial revolution for waterborne freight transport (see also section 4.3.4).

Central Bedfordshire Local Authority (Beds LA) - The administrative organisation of local government that is officially responsible for all the public services and facilities in the area of central Bedfordshire (which covers an area including Dunstable, Leighton Buzzard and Biggleswade).

Consortium (BMKW Consortium, or BMKWC) – A group of eight organisations that work together to deliver the Bedford & Milton Keynes Waterway. Member organisations are the BMKW Trust, Bedfordshire LA, Bedford LA, Milton Keynes LA, Canal & River Trust, Marston Vale Trust, Environment Agency & Milton Keynes Parks Trust (see also section 4.2.2).

Canal and River Trust (CRT) – A charitable organisation responsible for the management of the majority of the rivers and waterways that make up the national network.

Design – An activity conducted to initiate change in manmade things.

Design Objects – A physical object which has been created within the BMKW project, but is not physically part of the infrastructure. A design object is notable because it holds influence over other design activities which are conducted as part of the BMKW project.

DIG project – A BMKW Trust project with the goal to have Trust volunteers lead the physical creation of small sections of the waterway. These sections would be created in the near future with a section near the Marston Forest Centre being the preferred choice.

Fluid Design for Sustainable Transitions (FDfST) – A framework of design elements proposed through this research, which when employed in a project would support design activity in guiding it onto a pathway towards sustainable transition (see also section 7.2.4).

Fluid Transitions (FT) – A theoretical approach to sustainable transitions in the built environment which advocates allowing a project the flexibility to find its own transition pathway. Developed by Guy (2011) it identifies four qualities which when present in a project influence it to become more sustainable, and in turn contribute to a wider sustainable transition (see also section 2.4.5).

Green Infrastructure – A network of multi-functional green space which supports natural and ecological processes, whilst also contributing to the health and quality of life of local communities. The network can be new or existing, and be within an urban or rural setting.

Internal Drainage Board (IDB) – A national public body that manages water levels where there is a special need for drainage, ensuring works are carried out to reduce flood risk to people and

property, and manage water levels for agricultural and environmental needs. It is organised into districts which cover areas with high flooding risk.

Land Caretaker – The organisation or person charged with looking after the interests and maintenance of a portion of land. They do not normally own that land and usually are tasked with working for the common good (eg. Marston Vale Trust).

Land Developer – The organisation or person responsible for the development of a section of land from a green or brownfield state to an alternative use (e.g. housing, industry, forest).

Local Authority (LA) – The collective descriptor for an administrative body in local government responsible for delivering a range of public services. Depending on their location the type of local authority could be a county council, city council or a unitary authority.

Marston Forest Centre (MFC) – A multi-purpose facility located at the centre of the community forest being created by the Marston Vale Trust. The Marston Forest Centre hosts leisure and educational events and provides a venue for business events.

Marston Vale Trust (MVT) – A charity responsible for leading the creation of a community forest in the Marston Vale, in order to bring about the regeneration (both economic and environmental) of multiple large scale brownfield sites within the valley.

Milton Keynes Council (MK LA) - The administrative organisation of local government that is officially responsible for all the public services and facilities in the borough of Milton Keynes.

Outline Planning Permission – An approval in principle for a building, development or infrastructure which is granted by the Local Planning Office. It requires less detailed plans be submitted than for full approval and must be renewed every three years.

Planning Gain – A formally agreed provision to a local authority from a land developer, supplied as part of their agreed actions necessary to receive planning permission. The provision must benefit the community in which the proposed development is being built and can take the form of money, services or land.

Product Service System (PSS) – A business model for meeting consumers’ needs through the provision of a mix of products and services, with an emphasis on reducing the environmental impact of consumption.

Riparian Owners – A person who owns land next to a waterway or watercourse is a riparian owner. They have associated rights and responsibilities, including the responsibility to help maintain the watercourse to promote the effective management of flood risk.

Route side development – The construction of housing or commercial projects on land adjacent to the planned route of the BMK waterway (which can be linked through planning gain to the BMKW).

Steering Group – A small team of actors from the BMKW project charged with making technical project decisions on behalf of the Consortium. The team’s members are taken from both the Trust and Consortium.

Sustainability – The ability to continue a defined behaviour indefinitely. Usually presented in terms of finding a balance between environment, economy and society. A highly contested word and definition.

Transition – A change in the structural character of society involving a shift from one socio-technical system to another.

Trust (BMKW Trust, or BMKWT) - A charitable organisation which promotes the Bedford & Milton Keynes Waterway

Towpath – A trail along the side of a canal, river or waterway. Originally created for horses to walk on when they pulled boats, they have become multi-use trails travelled by pedestrians, cyclists and other leisure users.

Visual Communications - The design and production of maps, technical drawings and illustrations.

Watercourse – A natural or artificial channel through which water flows for drainage purposes.

Waterway – A river, canal, or other navigable channel used as a means of waterborne travel or transport (see also section 4.3.4).

Waterway Park – A name given to the infrastructure being created through the BMKW project. The name is unique to that project and is also used to name a design vision promoted through this research (see also section 4.3.4).

1 Introduction

This chapter introduces the doctoral research presented in this thesis. It begins by providing details of the background to the research and of the researcher. An overview of the research proposal and case study is then presented to set the scene for the research questions addressed in the thesis. The boundaries of the research are then set out and finally an overview of the thesis structure provided.

1.1 Background

The background to this research is concerned with three main areas: Sustainability, Transitions and Design.

1.1.1 Sustainability

Sustainability is a critical and urgent global issue of our time (IPCC, 2014). The evidence surrounds us in the form of environmental degradation, economic disparities and social fragmentation, posing the question: will life on earth flourish into the future? (Ehrenfield, 2008). We know that our current state is unsustainable and that as a global society we must change our behaviours, but struggle to see what a sustainable future would look like.

There is hope, since alternative paths to more sustainable futures, enabled by both top down initiatives and grassroots actions, are available. For example lowering carbon emissions by adopting clean renewable energy technologies, and developing less resource intensive consumption patterns. However these changes are not easy to implement as they tend to challenge and disrupt the entrenched status quo.

1.1.2 Transitions

Making requisite big changes toward more sustainable states looks difficult, even insurmountable. However, history is littered with examples of big changes, such as the shift from horses and carriages to cars as means of personal transport. Often referred to as transitions, such large scale

socio-technical changes can have profound impacts on societies, economies and environments. For transitions to take place certain influences must be present and actions must take place. The industrial revolution was a major transition, which happened because coal resources were available, steam engines were invented and mass production adopted.

At present we are seeking to stimulate and shape transitions to more sustainable futures; Sustainable Transitions. Some seek to affect large scale transitions by influencing national systems, such as the Dutch energy project. Others seek to affect smaller changes that contribute to the whole, such as the Transition Towns grassroots movement. In most instances, tools and methods to make these changes happen, effectively and quickly are needed.

1.1.3 Design

Concerning itself with “initiating change in man made things” (Jones, 1970) design became a discipline in its own right in the modern era. From an initial focus on the production of manufactured objects the discipline has grown to include both multiple specialisms, such as Design for Sustainability, and more widely accessible approaches, such as design thinking.

Employing a design approach requires developing a deep understanding of problems, creating multiple concepts for solutions, then focusing down to deliver a design that is appropriate to its context. That design might well be a product, such as a computer; a service, such as website hosting; or a system, such as an electricity grid. Design offers an approach which can be used to deliver many things. In contemporary design discourse this prompts the questions: what should design be doing, and what problems should design really be addressing? (Thackara, 2006)

1.2 The Researcher

My early career began with a mechanical engineering apprenticeship, leading into work ensuring the quality of production at a facility manufacturing automotive switchgear. Recognising a lack of creativity in this career path I changed direction to study design, a route that could build on my previous skills. While studying Design for Industry at Northumbria University I became fascinated

with Sustainability, and how design influences this critical issue. On graduation I found design work of a rather different focus, working for a research facility of the Ministry of Defence. I spent six fascinating years working with scientists and military to develop technical demonstrators of protection equipment, but eventually felt the need to change career path and look again at sustainability. Through completing an MSc in Design for Sustainability at Cranfield University I gained understanding of the range of issues surrounding sustainability and some of the ways design can make a difference. On graduation I continued to work in academia, contributing to research projects and lecturing in design. Aware of the demands of academic positions for publications and a research profile, I decided to undertake a doctoral research project. My application to the Open University was influenced by student recommendations, positive relationships with staff there and its proximity to my proposed research case study.

Epistemological and ontological standpoint

In my previous research positions I carried out mainly quantitative research to achieve prescribed goals. This research represents the first time I have determined the direction of a research activity and participated in qualitative research, informed partly by academic theories from the social sciences. As such it has raised questions which I have not faced before, such as ‘what is my epistemological and ontological standpoint?’ Through this research I have also started to understand my standpoint, which has emerged over years of practice, but never before been articulated.

My early engineering education and training promoted a positivist, systems orientated approach which placed highest value on quantitative data and analysis. However I had always felt uncomfortable with universal rules and frameworks, recognising that the world offers many disparate scenarios and influences which often require addressing on an individual basis. I now see myself as a constructivist researcher and as such believe that any phenomenon under examination exists within a landscape that is subject to multiple socially constructed perspectives, and interpreted through the observer and their viewpoint. My intention is to be reflective upon my own influence and views, and acknowledge them within my research practice.

1.3 The Research Proposal

Sustainability requires major change: transition to more sustainable states. How then do we ensure transitions to sustainability happen? Design offers a discipline that takes an active role in creating and producing change. Can design then play a role in bringing about sustainable transitions? We know that transitions are a combination of many changes, influences and activities. Socio-technical systems are constituted of both social and technical elements (which in combination form socio-technical configurations that satisfy societal demand) both of which can be influenced by design.

Sustainable Transitions are the subject of a growing literature. Experts have sought to understand how transitions can be conceptualised and managed (Geels, 2002; Walker, 2012). By and large this has involved the analysis of earlier historical transitions (Geels, 2002) and to identify actions in the present which may stimulate and shape transitions (Shove, 2012). Research has tended to focus on transitions at two scales. First, at the national scale research has generated theories to understand transitions, such as Multi-Level Perspective theory (Geels, 2002) and how to influence them, such as Transition Management (Rotmans et al., 2001). Second, at the micro or local scale, research has been conducted that draws on Social Practice Theory (Shove) and systems thinking such as Strategic Niche Management (Raven, 2006).

The Fluid Transition (FT) approach (Guy, 2011) is a theory of practice that accords a key role to design in sustainable transitions. Founded in architecture and built environment research, this approach seeks to inform design to create solutions that will contribute to sustainable transitions, while recognising that solutions should be contextually defined and thus often time and place specific. In order to enable this interpretive flexibility in the design process the FT approach promotes four qualities: Pragmatism, Flexibility, Situatedness and Participation. The approach suggests that the presence of these qualities within a project can lead to sustainable design solutions, which in turn contribute to sustainable transitions.

1.3.1 The case: the Bedford and Milton Keynes Waterway

A case study was selected to enable the exploration of the role of design in sustainable transitions as defined by the FT approach. This case was a trans-regional infrastructure project to build a new waterway between Milton Keynes and Bedford, which would close a gap in the national Inland Waterway network and provide access into the Eastern Fens. The inland waterway infrastructure has a rich history of over 200 years, in which time it has contributed to, and been subject to, many transitions. These include contributing to the success of the industrial revolution by providing cheap freight transport; suffering a slow decline as the railways and roads took away that freight traffic; and a rebirth as the infrastructure is adopted by the public as a place of recreation. The inland waterways would then seem a suitable place to look for and influence another transition, that to a sustainable future.

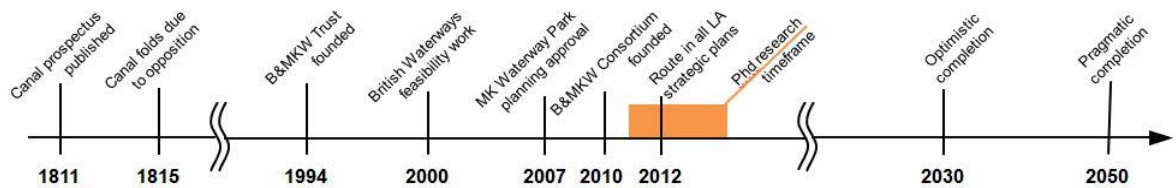


Fig. 1.1: Bedford & Milton Keynes Waterway project Meta timeline (indicative scale), related to research period.

The following section describes the story of the Bedford and Milton Keynes Waterway, providing a suitably contextual background for the rest of the thesis. The story details the period from its genesis through to the start of the research.

Public Genesis: 1960-2000

In this period the canal network underwent a metamorphosis, driven by socio-technical change. What had once been key industrial arteries had been driven into disrepair and in many places become a crumbling eyesore. However public activism, and the volunteer efforts it provoked, rescued many canals and over decades their rebirth took place. The canal network became a valued part of our national heritage, providing tranquil corridors for recreation and wildlife.

Nearly two centuries after the initial Bedford Canal proposal the regional geography around its route had changed. Now the new town of Milton Keynes had grown around the Grand Union canal and the Marston Vale was a largely brownfield post-industrial landscape in need of regeneration.

In 1994 amid a climate of optimism, economic growth and large scale public projects, Bedford resident Brian Young championed the idea of a canal as a suitably prestigious millennium project, and gathered a core band of local supporters to that cause. The Bedford and Milton Keynes Waterway (BMKW) Trust was born. Its justification for the waterway combined the obvious utility of closing a gap in the national network and the economic impact that the resultant recreational use and development potential would create. The BMKW Trust promoted the waterway with a vision of it contributing to the physical and economic regeneration of the area, through providing space for all manner of people to conduct a range of activities, so they called it a 'Waterway for All'.

The group of volunteers realised they couldn't deliver the proposed waterway themselves and started to engage with local groups to persuade them of the merit of the idea. Discussions were held with British Waterways, the three local authorities which spanned the route and some of the area's land owners. Whilst many of the groups are engaged by the vision of these enthusiastic amateurs, most view the scheme as 'pie in the sky', due to lack of funding and the volunteer's naivety regards the requirements of a strategic infrastructure project. However the volunteers doggedly persist in promoting their vision.

Gaining credibility: 2001-2007

The idea of a new waterway captured the public imagination and gaining enough momentum to generate interest from regional and national organisations. British Waterways (BW), who were responsible for the national canal network, assigned a senior officer to investigate the projects feasibility. He engaged with local communities and land owners to assess levels of support and the routes viability. After an extended round of presentations and discussions the officer found

widespread public support and enthusiasm. BW involvement added legitimacy to the project, which gained it further support. Formal public consultations were conducted to poll opinion on possible routing options, with a final route selected which combined technical viability, public support and political input.

As the BMKW project grew it was seen by BW as viable but outside their scope. A charitable Trust was created to promote the Waterway, made up of volunteers and supported in kind by expert organisations. The Bedford & Milton Keynes Waterway Trust identified its aims and objectives and set up teams of volunteers to carry out its activities. The Trust's volunteers were a wide range of people; many were keen boaters who saw a waterway as a fine goal to achieve, while others were retired professionals. This group of volunteers had an extensive network of contacts with which they were able to keep up to date with regional political developments and exert some influence. In this manner the BMKW Trust were able to progress the waterway project, but still struggled to gain the support of many organisations.

In 2004 the Trust applies to the National Lottery Funds Living Landmarks scheme for funding. It was awarded £250,000 in 2005 to develop detailed designs of a section of the waterway for the competition final. The Milton Keynes end of the route was chosen as it would provide the attraction of a navigable section with easy access from the busy Grand Union canal. The designs created combined the efforts of the Trust, town planners, landscape architects and civil engineers. The Milton Keynes Waterway Park proposal captured the integration of the waterway into its surroundings environment and created the design for a 'Waterway for All'.

In 2007 a senior civil servant was seconded from the Department for Community and Local Government (DCLG) to work with British Waterways on the BMKW project full time. He proved to understand the requirements for a strategic regional infrastructure project and conducted the first professional engagement with land owners about potential waterway routes. A series of route sections were identified which best represented local geo-political issues. This process created the A-Z Project Delivery Plan, which detailed the whole route, its different sections (helpfully identified from A-Z) and lots of associated project management issues.

The combination of substantial funding, the professional design work that funding enabled and professional project management activity meant the infrastructure project started to gain credibility with regional organisations and professionals. Pertinent project information had been collated into an indispensable document and a national funding body had recommended the project as a credible, viable and realistic proposition.

Securing the Route: 2008-present day

Informed by lessons learned from other major regional projects, the organisations involved in the BMKW project decided to formalise how they worked together. The BMKW Consortium was formed in 2008, bringing together the organisations which would deliver the waterway and look after it once completed.

The completed Milton Keynes Waterway Park design allowed a major section of the route to gain outline planning permission and was written into local authority plans. However funding was unavailable to repeat the process across the rest of the route. The BMKW Trust and Consortium made the pragmatic decision to focus their efforts on securing the route. Any serious block to the desired route would kill the project, if no alternate route was available. Where development or infrastructure changes were planned along the route pressure was exerted to firstly ensure waterway construction was aided not blocked.

The waterway route was eventually written into the strategic plans of all the local authorities, which provided access to the benefits of planning gain from route side developments. The BMKW Trust and Consortium worked with the Regional Development Agency to organise a response to the and successfully organised that an underpass was built as part of rebuilding of the main dual carriageway (A421) between MK and Bedford. The underpass future proofed a major infrastructure project for the benefit of the Waterway and set a precedent for other regional developments. The BMKW Trust started to build a trip boat to engage the local communities. Trust volunteers raised funds, developed specifications and set about designing a boat capable of carrying up to 70 passengers on trips along the Great Ouse in Bedford. Most people who worked

on the project started to talk about when the Waterway would be built, confident it would eventually happen.

At this phase of the BMKW project in 2011 this doctoral research started, and this researcher engaged in study of the project through attending public Trust events.

1.4 Research questions

The Bedford & Milton Keynes Waterway project is a live, dynamic, major infrastructure project which holds the potential to influence the sustainability of the surrounding region into the future. Given the projects proximity to the Open University campus, its public accessibility and the interests of the researcher, it was used in this research as a case study to explore how design can contribute to sustainable transitions.

The following research questions were developed to guide the research. These are founded in literature and as such presented and justified at the end of chapter 2, the literature review.

Table 1.1: Research questions

Research Question	How can design, informed by the Fluid Transitions approach, promote a transition toward more sustainable infrastructure in the case of the BMK Waterway?	<i>Where are the questions addressed?</i>
Research Sub-question 1	What design practices are evident in the case study and how do they influence the infrastructures future sustainability?	<i>Chapters 4 & 5</i>
Research Sub-question 2	Who are the actors within the case study informing design practice for sustainable transitions?	<i>Chapters 4 & 5</i>
Research Sub-question 3	What are the key elements of a sustainable transitions design practice?	<i>Chapters 6 & 7</i>
Research Sub-question 4	How can a fluid transitions approach be integrated within design practice in order to deliver effective sustainable outcomes?	<i>Chapters 6 & 7</i>

1.5 Scope of the Research

This research is inter-disciplinary and as such, it draws on multiple disciplinary perspectives, approaches, methods and tools. It is not rooted in the literature of one discipline, but takes knowledge and guidance from many, including architecture, design, and sustainable transitions. The research activity seeks to create new knowledge which will contribute to both theory and practice.

In order to address the research questions, multiple methods, including ethnographic observations, semi-structured interviews and design interventions were used. The BMKW formed the basis of a single longitudinal case study in which the researcher was immersed and developed a deep understanding of the activities taking place and the actors involved. A positive relationship was developed with case study actors who became willing participants in the research, including taking part in design workshops. To emphasise the depth and scope of the case study the following research activity metrics are presented:

- 36 ethnographic events observed
- 34 month period of ethnographic activity in the case study
- Approx. 500 occasions of interactions between researcher and case study actors.
- 10 interviews with key case study actors
- 19 workshop participants
- Approx. 130 case study actors received insights from the research
- Approx. 40 case study actors provided feedback on research insights
- 2 design workshop organised and facilitated

1.6 Thesis Structure

This thesis follows a standard layout. After this chapter, there is a literature review, a chapter in which methods used in this thesis are presented and justified; three results chapters; and a final chapter which includes an overarching discussion, conclusions and recommendations. The

content of the results is divided by data type into three chapters: Ethnographic, Interviews and Interventions. Appendices hold relevant but bulky data, which support but would disrupt the flow of the main thesis text. A detailed overview of the thesis is presented below:

Chapter 2 - Literature Review: Contains details of the scope of the research, focusing on the areas of sustainability, design and transition. It provides an overview of the literature in these areas, and further focuses on the sustainable transitions literature. It concludes by identifying and justifying the research questions.

Chapter 3 - Methods: This chapter considers the research design, research methods chosen and the application of these methods in practice. It concludes by considering the validity of the research and pertinent ethical issues and how these were addressed. An overview of methodologies is provided in this chapter with more detailed descriptions of how the methods were applied in relevant data chapters.

Chapter 4 – Ethnographic Data: This data chapter details the methods employed to gather and analyse ethnographic data from the case study. It provides an overview of the scope of observational activities conducted, placing the thirty six events observed within the timescale of the case study. The chapter presents both a top level overview of the case study and a narrative through the ethnographic data using four different stories. The stories address the main actor group of the case study, the nature of the case study in its context, the design activity that was found in the case study and the identification of language and objects in the research. Findings are identified from the ethnographic data.

Chapter 5 – Interviews: This data chapter details the semi-structured interviews undertaken in the research. The key case study actor interviewees are identified, followed by a description of interview methodology and rationale for the questions used. Descriptions are provided of the methods for, among other things, qualitative data analysis methods employed. Codes and themes from the data are presented and interpretations provided. Findings specific to the interviews are identified and presented.

Chapter 6 – Interventions: Contains details of the series of interventions undertaken in the case study, conducted to influence the case study project towards a more sustainable outcome. An initial section assesses ethnographic and interview findings against the Fluid Transitions framework and makes observations on the project's status. A strategy for the interventions is developed and literature that informed their development is identified. The interventions are described, along with associated data generated. The interventions data is analysed and interpreted in light of the FT project assessment and the research questions.

Chapter 7 – Discussion & Conclusions: Presents a discussion of the research findings from ethnographic, interview and intervention activities. A narrative is presented which combines the research findings from all data types to answer the research questions and draw out insights that provide a unique contribution to knowledge. The validity and impact of the research are examined in light of the insights generated and questions answered. Conclusions are drawn and recommendations made.

2 Literature Review

This chapter details the literature review conducted as part of the research. Firstly an introduction identifies how the literature was scoped out to support this trans-disciplinary research. Secondly the main body of the literature is presented, through sections examining Sustainability, Design and Change in turn. Next a discussion section pulls together the findings from the research. Finally a conclusions section identifies the research gap and research questions.

2.1 Introduction

A literature review was conducted to create a broad, robust foundation of knowledge for this trans-disciplinary research. Figure 2.1, below, provides a diagrammatic map of the scope of literature supporting this research. It identifies sciences, disciplines and themes that were of interest, alongside key authors who informed my understanding. Finally, the red dotted area denotes the selected focus of my research.

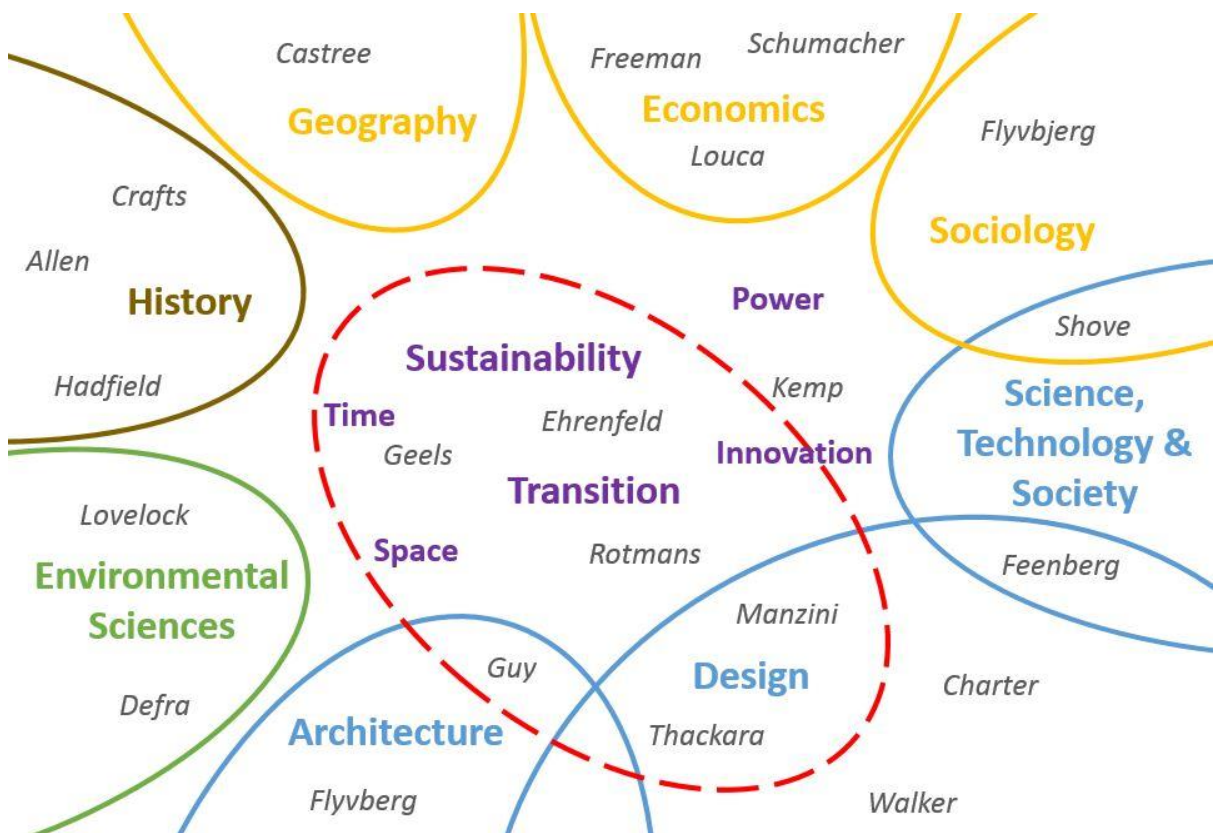


Fig. 2.1: Map of literature review scope, related to research focus.

The literature review provided multiple perspectives that informed my research. This broad base of knowledge provided a robust foundation for the doctoral research. Whilst many sciences and disciplines have provided some level of knowledge and insights which have informed and supported the research, certain key disciplines and research themes were central to the research focus, informing its chosen direction. Consequently this literature review is presented under three key headings, bringing together disciplines and themes into a suitable narrative:

- Sustainability
- Design
- Change

All three of these areas have contested definitions and boundaries. The literature review examines the discourses around these areas, how they are interlinked and which are most informative for this research. A narrative is drawn from the literature which highlights a research gap and research questions to be identified.

2.2 Sustainability

Perspectives on Sustainability

This research has been initiated under the assumption that ‘sustainability’ is a desirable goal, and that the research will assist in the attainment of this goal. This section of the literature review will therefore examine the drivers around the sustainability agenda; discuss associated concepts and definitions, focus on our present society and why it is unsustainable. It concludes by identifying what needs to be done to achieve sustainability.

Sustainability covers a range of issues and represents the combination of several emerging discourses. Since the late 1960’s there has been a growing awareness that the actions of our present human society are damaging our global eco-system, not only its present state but also its future potential. Marine biologist and conservationist, Rachel Carson (1964) was among the first to highlight the tightly bound relationship between the actions of humans and the impacts of

these on the environment. Her book *Silent Spring* specifically drew attention to the unforeseen damage of industrial processes on local ecosystems. In 1972, *Limits to Growth* (Meadows et al., 1972), a controversial report commissioned by The Club of Rome, provided a critique of current policies of economic growth that challenged the future potential for our resource-heavy global consumerist lifestyle. Twenty years later the first Earth Summit in Rio de Janeiro determined Agenda 21 (UN, 1993) that presented suitable goals for regional action to move towards a better future. Since then the United Nations Intergovernmental Panel on Climate Change (UN IPCC, 2014) has continued to publish and respond to scientific evidence of the negative, man-made impacts on our climatic systems and global environment. From this growing knowledge we have become aware of the effects of our global human actions; climate change, ecocide and society's dependence on finite resources.

This gradual emerging recognition of the impacts of human activity on our planet has led to calls for development towards 'sustainability'. The World Commission on Environment and Development (WCED) Brundtland Report (UN GA, 1987) offers the commonly quoted definition of sustainable development as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs". This definition questions what we view as our "needs"; it asks us to consider the impacts of what we take to fulfil these needs, and if that could be sustained into the future. To aid understanding of the concept of sustainability it is often presented as the balance between the environment, society and economy (Ehrenfield, 2008). Here sustainability is the equitable balance between the three categories, in order to protect the wellbeing and livelihoods of present and future global populations.

Our present society is in a state of unsustainability and focused on models of unsustainable development. This is due to a range of factors. The success of a nation is primarily judged by the strength of its economy, reflected in the use of Gross Domestic Product (GDP) as the standard global measure of the performance and success of countries. GDP is "the market value of all officially recognized final goods and services produced within a country" and ignores social wellbeing of the populace (NEF, 2012) or the state of its natural environment. Also the historical

process of economic development has been built on the exploitation of finite resources (Heinberg, 2011), some of which are now becoming scarce and increasingly difficult to extract. These factors have combined to create an unsustainable global production and consumption model. Goods are produced from precious finite resources and then consumers are encouraged, through advertising and marketing, to quickly upgrade to a new model due to fashion styles or technology 'upgrades'. This model of rapid product obsolescence places functional goods into the waste stream, with the new products providing consumers with little tangible benefit (Thackara, 2006). All these factors combine to lock our global society into an unsustainable development model, re-enforced and driven by our present dominant economic model of continuous growth.

From our unsustainable present it is very difficult to envisage what a sustainable future might be. There is no consensus on what 'sustainability' is, with an on-going contested discourse about both its definition (Guy & Farmer, 2001) and validity. In order to promote visions of sustainable futures Ehrenfield (2008) offers a definition of Sustainability as "the possibility that human and other life will flourish on the planet forever", hoping that this progressive view will engage and promote positive action with the widest of audiences. The World Wildlife Federation (2014) maps different country's ecological footprint against their United Nations Human Development Index, identifying those countries which achieve the best balance between resource use and social wellbeing. Against these sustainability parameters it is Cuba which scores highest, even though that is a country with poor GDP. This is a difficult assessment for citizens of countries with high GDP consumerist economies as this kind of sustainability would then seem to come with increased hardship and lack of choice.

There are multiple ideas about how society might become more sustainable. The United Kingdom's Government (HMG) has developed plans for addressing the nations reliance on finite fossil fuels for energy (DECC, 2011). As the global renewable energy market quickly grows (Heinberg & Fridley, 2016) equipment costs could drop and enable more radical national energy plans for a zero carbon Britain by 2030 (CAT, 2013). The European Commission has policy promoting sustainable production and consumption patterns (2012a). Information for consumers

about the sustainability performance of goods, in the form of awards and labels, is increasing consumer awareness and possibly influencing demand. A regenerative business model is proposed through the Ellen MacArthur Foundation concept of a Circular Economy (Webster, 2015) that enables resource re-use and waste reduction in consumer goods. Organisations such as the New Economics Foundation (2012) are promoting alternative economic indicators to GDP, which recognise social well-being and the eco-services that the environment provides. Embracing all these activities would move our society towards sustainability, but they struggle to gain traction as they are also seen to work against incumbent interests and the dominant economic growth agenda. What is clear is that at present there is a lack of meaningful action to move society towards real sustainability (Meadows et al., 2004). And also, if global society is to become sustainable, major changes are needed in the systems of society at all levels, including global economics, countries' resource use and individual consumption patterns (Heinberg, 2011; Jackson, 2011).

This section has highlighted sustainable development as an urgent and necessary action, identifying the range of stimuli that have driven this insight. It has also presented the views of many authors who argue that our present global economy and 'developed' lifestyles are inherently unsustainable, and that the sustainability goal is difficult to envisage from this present position. It appears clear however that the journey to a sustainable future will require a massive level of change at both a personal and global scale.

2.3 Design

The Relationship between Design and Sustainability

Having described sustainability as a desirable goal it is necessary to identify and detail the activity which will enable requisite changes to reach this goal. For this research that enabling activity is 'Design'. Many experts talk of the role of design in helping overcome the challenges of unsustainability (Manzini, 2015; Thackara, 2015; Walker, 2014). Consequently this section will firstly look at what design is, the practices and discipline of design, along with how 'design

thinking' can be seen as a more inclusive activity with much wider application than new product development. The section will go on to describe the relationship design has with sustainability, how this has changed over time and examine present discussions in this area. It will conclude by identifying themes that link to sustainability and change, thus informing the research questions.

The Cambridge dictionary (Cambridge University Press, 2011) definition of 'Design' is "the creation of a plan or convention for the construction of an object or a system". This definition of Design fits well with the structured professional disciplines which have emerged in the twentieth century. Designers have historically combined elements of craftsman, engineer and artist to create things that have previously not existed. Through problem definition, idea creation, visualisation and prototyping the act of design harnesses human creativity to create the new. Jones (1970) examines multiple definitions of design, proposing that the purpose of design is "to initiate change in man-made things". This activity has taken place throughout history (designing more effective flint hand tools in the Stone Age) and takes place across many disciplines (architects designing buildings, engineers designing mechanisms and planners designing infrastructure). It is this wider 'design' activity, which is not limited to the designer as practitioner that will be the focus of this research.

A wider view of design practice can be seen in the discussion of 'design thinking'. Tim Brown (2009) describes design thinking by focusing on its role in enabling the innovation process of business. He describes an inclusive practice that needs to engage a wide community of actors, which is collaborative in nature and may be summarised as, "design thinking converts need into demand". Buchanan (1995) has described design thinking as a broad activity, in which anyone can participate, giving humans the ability to tackle 'wicked problems' (those problems that are indeterminate in nature and fall within the boundaries of multiple disciplines). Considering these factors design thinking appears most appropriate for addressing sustainability, due to its process, inclusivity and the nature of the unsustainability 'problem'.

In the twentieth century industrial design developed as a modern discipline (Sparke, 2004), initially through practice-based activity and then academic theory. Its role was within the context

of the mass produced artefact, improving aesthetics to increase demand and consumption. Functionality and utility could also benefit, especially when driven by the modernist 'form follows function' dictum, but this hasn't always been the case especially when the drivers of design are purely profit based. Businesses now often recognise the value of design (Cox, 2005), harnessing creativity for successful innovation design can add value to a business. Whilst also being part of the creative industries which contribute a significant part of the UK's economic activity.

Over time design has developed to be more than being a tool for increased consumption and profits. Design approaches and specialisms have developed that are concerned with a greater good. For example, 'Human factors' engages with anthropometric data to optimise designs to the human form, increasing effectiveness and ease of use. 'Inclusive design' is employed to ensure the widest range of people is able to utilise an artefact irrespective of their age or ability (Chick & Micklethwaite, 2011). 'Participatory design' promotes practices that engage with the user in order to influence an artefact's design and produce a more successful outcome. However, all these approaches represent an anthropocentric outlook, concerning themselves solely with the interaction of the artefact and human user. What of the wellbeing of the wider society, the impact upon the surrounding environment, the effects on global systems at the present and into the future? These issues are the concern of sustainable design.

Sustainable design has developed over time as a reaction to growing awareness of environmental and socio-economic issues, and design's contributory role. Different design movements, with varied foci, goals and terminology have emerged over time in response to changing concerns (Bhamra, 2004; Dewberry & Goggin, 1996), and can be described as:

- Environmental design; focusing on environmental issues and 'end of pipe' solutions
- Green design; focusing on addressing single issues (e.g. recycled material use), often with a marketing-led agenda

- EcoDesign; incorporating many green design practices to minimize the environmental impact, but now addressing the full lifecycle of an artefact, through all phases of a product's life (from cradle to grave)
- Sustainable Design; building on EcoDesign best practice, introducing ethical and equity issues and applying these to an extended lifecycle. While focusing mainly on technological solutions within the present consumer paradigm it also introduces alternatives to product ownership, such as services and leasing.

This chronological listing of design movements represents moving from shallow, evolutionary, incremental change towards deeper, more radical and disruptive change (Bhamra, 2004).

It is with the EcoDesign movement that the approach of Life Cycle Thinking (LCT) is first embraced. LCT recognises the different phases within the life of a product and helps identify environmental related issues that might otherwise have been missed (EC, 2012b). The phases are generally recognised as; Sourcing, Production, Distribution, Use and End of Life. Thinking about the lifecycle of a product while in the design stage enables understanding of the flow of resources in each of these phases, then weighting, balancing and minimizing associated impacts. The name 'Life Cycle' implies a cyclic nature, however unless measures are made to manipulate the end of life phase, to preferable options such as recycling or re-use, the present prevalent product life cycles models tend towards linear flow into landfill. The development of the Cradle to Cradle approach (McDonough & Braungart, 2003), described later, and the Circular Economy (Ellen MacArthur Foundation, 2013) both attempt to address this issue.

The Sustainable Design movement has various approaches which can be employed to make designed artefacts more sustainable. The Factor Four approach (Weizsacker et al., 1997) promotes resource productivity asserting that "the amount of wealth extracted from one unit of natural resources can quadruple". Weizsacker et al. (1997) use examples to show how intelligent design can produce solutions that are resource efficient throughout their life cycle, often at negative cost for both supplier and consumer. The examples are mainly technocratic, relying

predominantly upon technology driven solutions that fit within a business-as-usual economic and social landscape. They can be accused of falling short of both sustainability goals and market demands. These approaches mainly focus on reducing environmental impacts through technological fixes to the present product-based consumer paradigm. An alternate approach (Mont, 2001; Cook et al., 2012) involves replacing individual product ownership by providing consumers with the service or results those products would provide. This is the approach of Product Service Systems (PSS), and can bring with it environmental benefits of reduced resource use, through the use of fewer products of increased longevity, whilst also challenging the current unsustainable consumer paradigm of product ownership. PSS doesn't come without its challenges, as user activities could change when consuming a service and service provision will have associated sustainability impacts and resource use.

While these sustainable design approaches exist it has been observed (Dewberry & Goggin, 1996; Sherwin, 2004) that action by business has been mostly of the Ecodesign variety, making existing product paradigms less unsustainable through incremental improvements. Ehrenfield (2008) expands on these concerns with his observation that "almost everything [currently] done in the name of sustainable development addresses and attempts to reduce unsustainability. But reducing unsustainability, although critical, does not and will not create sustainability". These observations raise questions about our present approach to sustainable design and whether it is appropriate, given its inability to create sustainability.

The discussion about sustainability within the design community and the need for a different sustainable design strategy has coalesced around a central idea – namely that sustainable design seeks to fit sustainability into design, while we really need to place design within the wider sustainability discussion (Chick & Micklethwaite, 2011). The wider sustainability discussion is about exploring new ways of living and within this discussion design has the possibility to influence our actions as citizens and not just as consumers. This strategy is called Design for Sustainability and has been defined (Thorpe, 2007) as "theories and practices for design that cultivate ecological, economic and cultural conditions that will support human well-being

indefinitely”. The difference between the strategies of Sustainable Design and Design for Sustainability is visualised in Figure 2.2 (Dewberry, 2011).

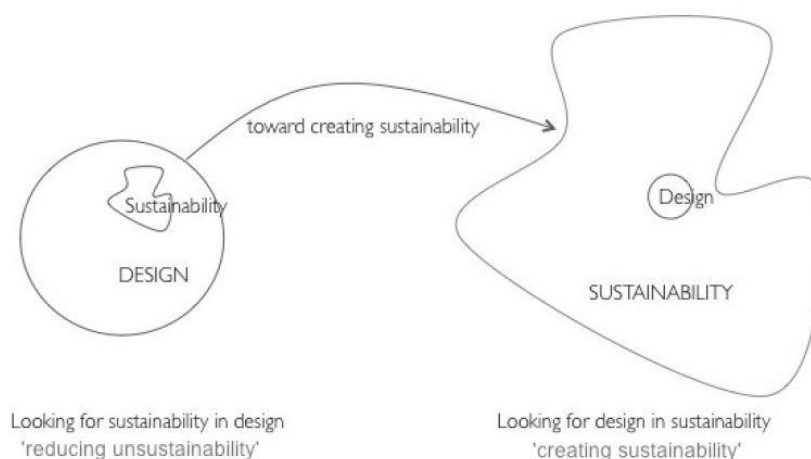


Fig. 2.2: Visualising the difference between Sustainable Design (left) and Design for Sustainability (right), from Dewberry, 2011.

Adopting the Design for Sustainability strategy when dealing with our present production and consumption paradigm will help us rethink this material culture “by developing solutions that challenge precedents and demonstrate alternative possibilities” (Walker, 2006). As a method of changing this paradigm it is supported by Amado & Ambrose’s (2001) proposal that efforts should focus on “enabling people to change the way they think about the problems around them, to alter their perspectives, and to discover new possibilities for action which can never occur to them as long as they remain on the secure rail tracks of their habitual mind-sets”. Design approaches have emerged which inform the practice of design for sustainability.

The Cradle to Cradle approach (McDonough & Braungart, 2003) takes lessons from nature and applies them to design within the industrial context. It progresses life-cycle thinking by growing its boundaries, moving from a linear Cradle to Grave to a Cradle to Cradle cycle. Here waste is not an option and instead becomes ‘food’ for the industrial cycle, what McDonough & Braungart term ‘technical nutrients’ (2003). Manipulating the flow of technical nutrients can change an artefact lifecycle into closed loop. Cradle to cradle also promotes that at the end of one life an artefact be

‘up-cycled’ to an alternative use that adds value to its material parts. This approach is directly inspired by nature and the systems we can identify there that make it sustainable.

Scenarios of sustainable wellbeing (Manzini, 2015) use design to enable people to explore and find new ways of living which are more sustainable. It proposes the role of design in helping create design orientated scenarios, which are visions of a more sustainable future enabled through design, inspired and directed by the potential future participants. In this way the public can be helped to envision a more sustainable future scenario which may not previously have been apparent, while also allowing the pathway to that future to be more easily identified. Manzini (2015) goes on to identify the criteria for sustainability wellbeing in this context as having “to be related to the qualities of the context of life and to be based on solutions that have to be at the same time lean and regenerative”. This approach concerns itself directly with the social aspect of sustainability and how design responds to it.

The previous two examples of approaches to Design for Sustainability show how design practice could be used to initiate radical and disruptive change to alter the present production and consumption paradigm, to create sustainability that would reach out into our everyday lives. These uses of design practice would have affect outside of design’s present mainstream focus, both significantly altering the use of technology in production and empowering people to choose future pathways that are not yet available through conventional business offerings. It is the radical pathways that these Design for Sustainability approaches present that offer the greatest potential for design practices to bring about the systemic and disruptive change which is needed for a sustainable future. Only then will we achieve Ehrenfield’s (2008) goal of ceasing to address unsustainability and instead to create sustainability. This is a view prevalent in both design and sustainability literature, criticism of designs unrealised potential and a demand for a radical future pathway (Mau, 2004; Ehrenfield, 2008; Jackson, 2011; Irwin, et al., 2015; Manzini, 2015).

In summary, design practice takes place both as a discipline-specific activity contributing to the production and consumption cycle of our society, and as the wider activity of design thinking involving collaborating disciplines and end users. Over its history the design discipline has

developed specialist strategies that address emerging issues, including that of sustainability. Early strategies addressing sustainability were single issue focused and promoted incremental change. Eventually Design for Sustainability has emerged as the preferred strategy to address wider notions of sustainability. It offers approaches with the potential to initiate radical and disruptive change that could alter the present production and consumption paradigm, and help bring about the change which is needed for a sustainable future. Sustainability requires great and systemic change. Design can be an enabling activity for change at the systemic level. This use of design is not happening and the potential of design is not being fully realised.

2.4 Change

2.4.1 Achieving Sustainability through Change

It has been shown that sustainability demands great change and that design stimulates and enables change. It is therefore important to examine the concept of 'change' in more detail. There are many kinds of change referred to through a wide range of terminology. Table 2.1 below shows a lexicon of change identified through this research (Cambridge University Press, 2011), providing definitions to change terms and grouping them into major and minor changes.

Table 2.1: A Lexicon of change: Cambridge University Press (2011) dictionary definitions of change terminology.

A Lexicon of Change		
Major	Change	to make or become different, or to exchange one thing for another thing, especially of a similar type
	Transition	a change from one form or type to another, or the process by which this happens
	Transformation	a complete change in the appearance or character of something or someone, especially so that they are improved
	Innovation	(the use of) a new idea or method

	Adaptation	the process of changing to suit different conditions
Minor	Modification	a change to something, usually to improve it
	Adjustment	a small change
	Modulation	to change the style, loudness, etc. of something such as your voice in order to achieve an effect or express an emotion
	Development	when someone or something grows or changes and becomes more advanced
	Diversification	to become more varied or different
	Shift	to (cause something or someone to) move or change from one position or direction to another, especially slightly

As discussed earlier, the change needed for real sustainability is the kind with the potential to influence actors across society. This literature review identified a range of major change terminology, and following initial explorative reading it was determined that the most appropriate focus would be on understanding major change categories of innovation and transition as these can be seen to relate to both the aspects of sustainability (economy, society and the environmental) and practice of design. The following sections detail innovation and transition, explore how they relate to sustainability and design, and focus on the more detailed areas that emerge.

2.4.2 Innovation

Innovation has been acknowledged as a driver of economic progress since early last century. Tarde (1903) first formalised an innovation process and identified the S-shaped diffusion curve of new products within a market. Contemporary views on innovation have been shaped by economists (e.g. Schumpeter), business thinkers (e.g. Drucker) and creative thinkers (e.g. Buckminster Fuller) alike, with current knowledge on innovation shaped by the resolve that it is the desirable goal of business and economic growth.

The work of Trott (2005) is concerned with the management of innovation for business, defining innovation as “the management of all the activities involved in the process of idea generation, technology development, manufacturing and marketing of a new (or improved) product or manufacturing process or equipment”, going on to clarify its components with a simple equation “Innovation = theoretical conception + technical invention + commercial exploitation”. Again focusing on a business orientated understanding of innovation the Organisation for Economic Cooperation and Development (OECD) sets out in their Oslo Manual (2005) to identify, categorise and measure innovation. The manual identifies three broad categories: product, process and organisational. These insights and definitions do little to explain innovation outside of a business orientated context.

As business, represented by economy, is only one aspect of the sustainability triptych then innovation towards sustainability must include wider aspects. The Eco-Innovation Laboratory is a European funded research collective which gathers and analyses ‘eco-innovation’ information from the region. They offer a definition for Eco-Innovation (2010) as, “any innovation that reduces the use of natural resources and decreases the release of harmful substances across the whole life-cycle”. While a definition for Sustainable Innovation is provided by Charter and Clarke (2007):

“a process where sustainability considerations (environmental, social, financial) are integrated into company systems from idea generation through to research and development (R&D) and commercialisation. This applies to products, services and technologies, as well as new business and organisation models”

Both these definitions fit innovation within a business frame, while using different assessment criteria.

Assessing innovation by environmental improvement Stevals (1997) broadly identifies four levels of innovation, which are more helpfully focused on outcomes as opposed to defining the component parts:

- Incremental; improvements to existing products,

- Re-design; re-designing present products within scope of technical feasibility,
- Functional; providing alternative product service systems to fulfil need,
- Systems; requiring societal behaviour change.

Here the innovation levels of 'incremental' and 're-design' describe the majority of innovations developed by and for our present business models, as discussed in the design section (Sherwin, 2004). It is the 'functional' and 'systems' innovation which offer the potential for the disruptive change needed to move our whole society towards sustainability as they extend outside the present 'business' frame of product based consumerism, to include alternative economic models and wider societal aspects.

This shows that while much of the early research on innovation concerned with sustainable issues focused on discrete products, particularly the development of cleaner products to replace incumbent 'dirty' ones. It was increasingly recognised that in order to attain sustainability broader large scale transitions would be required. This was driven by a number of emerging issues, including the need to tackle so called system effects, such as rebound effects, where increases in environmental performance which may be gained from a new product are cancelled out by increases in demand for and stimulated by it (Jackson, 2011). Also, the difficulties of identifying 'clean products' were under estimated, with many so called clean products turning out to offer fewer environmental benefits than their promoters suggested. And finally, the emergence of global environmental problems such as climate change, as opposed to local air pollution, called for broader, deeper, more fundamental change. Thus as suggested by the four levels of innovation posited by Stevals (1997) the analytical lens of environmental innovation was broadened to encompass systems innovation and transitions (Elzen et al., 2004). These ideas are explored in the following sections, firstly looking at the context within which these changes can be seen to be taking place, through widening a view of just technology led innovation to include the interaction of society.

2.4.3 Science, Technology and Society

Historically the development of technology has been seen as a neat linear process, guided by an inherent techno-logic, which eventually impacts upon society (Grin et al., 2010). Science, Technology and Society (STS) studies have emerged in recognition that both Science and Technology take place within a social, political and economic context, within which they have a reciprocal influencing relationship (Mackenzie & Wacjman, 2013). The study of STS is “concerned with science and technology in a social context in which science and technology both shape, and are shaped by, the society in which they are performed” (Bridgstock et al., 1998).

STS focuses on the interaction between technology and society through two main aspects. Firstly, mapping actors and heterogeneous elements, and secondly, mapping technology development as the outcome of agency and social group interaction (Grin et al., 2010). Understanding these aspects have allowed STS academics to look at historical technological development, identifying actors moving between domains and their contingent viewpoints, and demonstrating how this has influenced the emergence of dominant designs. This analysis shows that technological development is not the outcome of an “inherent technical logic, but the outcome of agency and the interaction of social groups” (Grin et al., 2010).

STS has historically used the conceptual perspectives of Actor-Network Theory (ANT) (Latour, 2006) and Social Construction of Technology (SCOT) (Bijker, 1995). The socio-technical approach of ANT focuses on the interrelations of actors and their networks, as they provide insights on the “messiness of technological development in local practices” (Grin et al., 2010). SCOT employs interpretative and socio-cognitive process, analysing technological change as a process of sense making (Bijker, 1995). It describes how different social groups interpret emerging technologies, describing associated goals, problems and requirements. Over time actor groups negotiate shared meanings, gradually reduced through closure, towards a dominant interpretation that supports the dominant design.

STS highlights and examines the societal influences on the development and manifestation of technology. Design is intrinsic to the creation of technology and thus subject to the processes STS describes (Guy and Moore, 2005). The knowledge created, and research methods used, by STS studies has directly informed academic theory on systems innovation and transition.

2.4.4 Transition and systems innovation

The term transition has gained popularity and been widely used to describe a big change in our society from one form to another. The UK government have published the Low Carbon Transition Plan (DECC, 2009), setting out plans for how the country should move from carbon intensive to low carbon activities in order to meet the requirements of the Climate Change Act. The New Economics Foundation (2012), who set out their interest with the tagline “economics as if people and the planet mattered”, argue that nothing short of a Great Transition (2010) is necessary to change course from business as usual to build an “economy based on stability, sustainability and equality.” While a grassroots movement gathers local clusters of the public within the Transition Towns movement (Hopkins, 2008), in order to achieve their mission “to inspire, encourage, connect, support and train communities as they adopt and adapt the transition model on their journey to urgently rebuild resilience and drastically reduce CO₂ emissions.” These are all examples of where and how transition is used in today’s language.

Transition is also now the focus of multi-disciplinary research, current interest being driven by the need to understand how historical transitions occurred, how desirable transitions could be brought about and how we might both recognise and manage an on-going transition. In describing attempts to do the latter Rotmans et al. (2001) provide a definition of transition as a “gradual, continuous process of change where the structural character of a society (or a complex sub-system of society) transforms.” A further, wider definition for a transition (Elzen & Wieczorek, 2005) is “...a long term change in an encompassing system that serves a basic societal function..[where] both the technical as well as the social/cultural dimensions of such a system change drastically”, with Geels & Schot (2010) boiling transition down to “a shift from one socio-

technical system to another”. The works of these authors suggest a set of characteristics of transitions:

- Transitions are co-evolution processes that require multiple changes in social and technical systems, which include technical innovations, consumer adoption and social embedding.
- Transitions involve radical change to shift from one system to another.
- Transitions are long term processes, taking 40- 50 years in all.

The transition has been further detailed by breaking it down into the following series of conceptual phases (Rotmans et al., 2001), also shown in figure 2.3:

- Pre-development – dynamic equilibrium where the status quo does not visibly change.
- Take-off - the process of change gets underway because the state of the system starts to shift.
- Acceleration – visible structural changes take place through an accumulation of socio-cultural, economic, ecological and institutional changes that react to each other.
- Stabilization – the speed of social change decreases and a new dynamic equilibrium is reached.

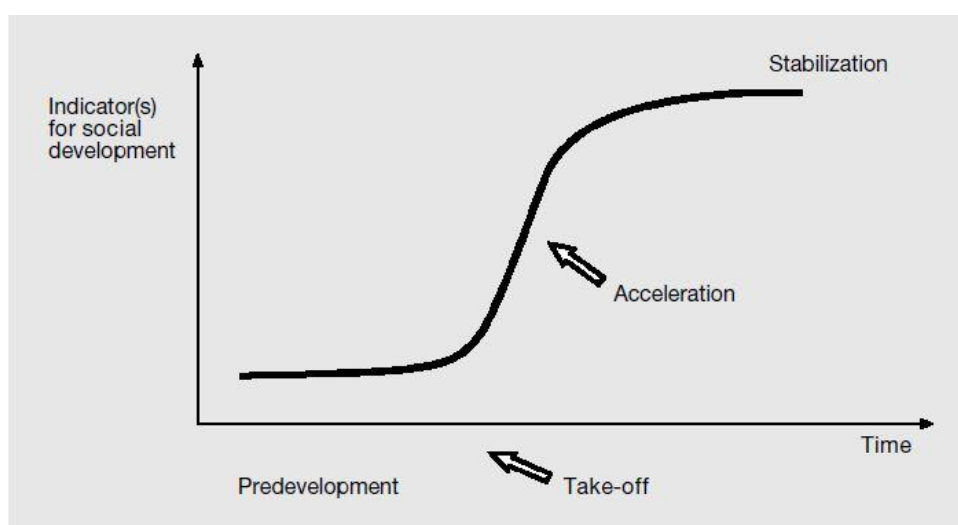


Fig. 2.3: Conceptual phases of transition, from Rotmans et al., 2001

Elzen & Wieczorek (2005) provide further detail on transitions in identifying common attributes:

- Multi-actor: involving a wide range of actors.
- Multi-factor: the result of many factors influencing each other.
- Multi-level: involving change at many levels (micro-, meso- and macro-levels).

Transition as detailed here is an event taking place in a complex system, where many changing actors and organisations inter-relate through multiple channels, over a long period of time. This system would be truly complex, in that changing one factor or dimension will have unpredictable effects upon other dimensions.

In this section we have examined literature concerned with transitions and systems innovation. This has provided a broad level understanding of what transitions are and how they come about, but leaves many unanswered questions for those interested in present or future transitions, especially those towards sustainability: What exactly is happening in these transitions? What can we do to influence them? How do we promote a beneficial transition to a more sustainable future? How can design play a role in transitions? The following section attempts to find answers for these questions within academic research into sustainable transitions.

2.4.5 Sustainable Transitions

This section will examine the range of academic frameworks that deal with sustainable transitions. It will focus firstly on a framework which attempts to understand transitions in detail, and then briefly examine ways of managing transitions towards desirable goals. It then moves onto theory that describes the social aspect of transitions in more detail, and finally examines an approach which is aimed at guiding practice to influence transitions.

The Multi-level Perspective (MLP) is a heuristic framework, which aims to present a prescriptive narrative of how the world works with regards to the development and employment of technologies within society (Geels, 2002). The perspective of MLP is that a global view of our world and society can be represented by multiple levels of nested hierarchy, holding niches, regimes and landscape (as shown in Figure 2.4). Here a macro level 'regime' holds dominant socio-technical systems, macro level 'niches' are home to emergent radical innovations; all taking

place within a meso-level ‘landscape’, which casts effects onto the niche and regime. This multi-level model aims to describe foster understanding of transitions and the dynamic multi-level interactions that influence them.

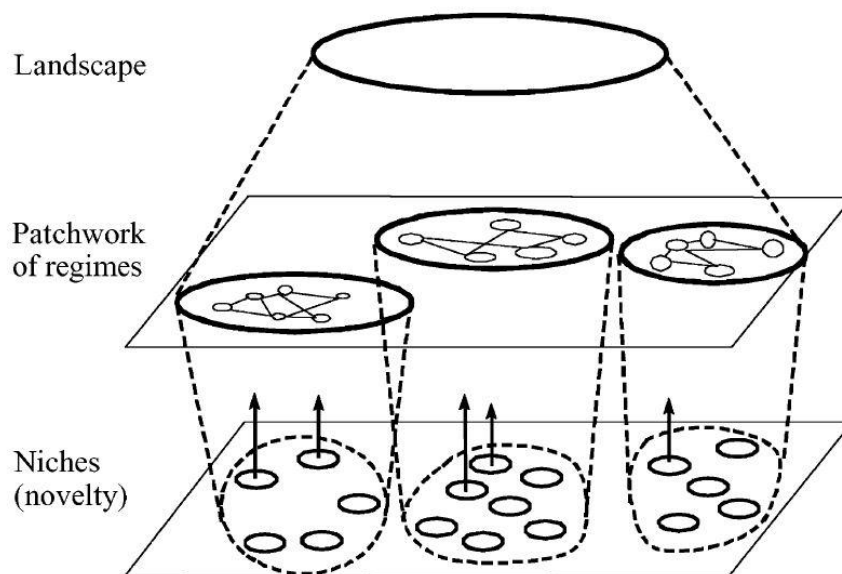


Fig. 2.4: Multi-Level Perspective as a nested hierarchy, from Geels, 2002.

Primarily developed by Frank Geels, the MLP has a theoretical background in STS, evolutionary economics and sociology (Geels, 2011). Populating the MLP and mapping out the multi-level interactions builds on these theories and associated assumptions (Grin et al., 2010). Technological regimes exist that employ cognitive, regulative and normative rules. While only experts and engineers participate within the technological regime, other actor groups participate within socio-technical systems (scientists, users, policy makers, etc.). Both combine to create socio-technical regimes where they develop networks of mutual dependency (Grin et al., 2010). The niche level shares many of the regimes’ actors and structure, but holds within it the seeds of transition. Niches can be the home of disruptive innovations which breakthrough into the regimes, but are places of uncertainty and flux, subject to barrier forces of the regime (Raven, 2006). Socio-technical landscapes exist as representations of physical and metaphysical domains, which are subject to increased levels of structuration and beyond the influence of the regime and niche. The landscape level has potential to exert influence upon the regime and niche levels through

scenarios that act across time; slowly, long term or as sharp shocks (Raven, 2006). Figure 2.5 (Geels & Schot, 2007) presents a diagrammatic representation of a transition over time, plotting the multi-level interactions and stability of technologies as viewed through the MLP.

The MLP suggests that socio-technical regimes reach a state of 'rigidity' where they are locked into shared trajectories with other regimes and interpenetrated with networks of mutual dependency (Geels, 2002). This regime rigidity presents strong barriers to the success of niche innovations. Geels & Schot (2007) highlight four possible transition pathways; Transformation; Technological substitution; Reconfiguration; De-alignment and re-alignment. Each pathway is enabled by specific types of landscape influence and set of conditions in the regime and niches.

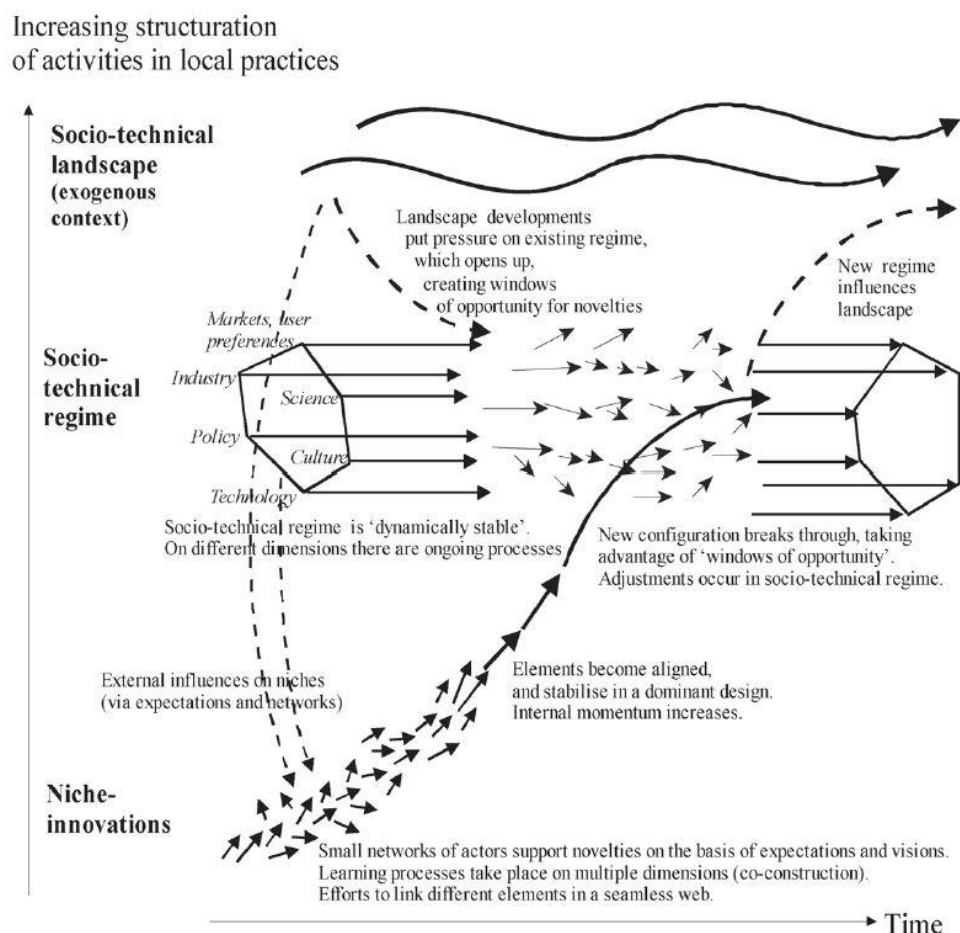


Fig. 2.5: Multi-Level Perspective on a Transition viewed over time, from Geels & Schot, 2007.

The MLP has been used to analyse historical case studies (Geels, 2002; Geels & Raven, 2006), focusing on making sense of recognised transitions, emergent novel technological innovations and the associated regime change. Here the MLP sits easily as a framework for analysis, hindsight helping to identify the important actors, niches and influences. The MLP has also been used to inform national policy, such as contributing to the generation of transition pathways to low carbon energy systems (Foxon et al., 2009) by informing the energy industry of potential near future scenarios.

Criticisms have been made of the MLP (Genus & Coles, 2008; Smith et al., 2010; Shove, 2012) and its take on sustainable transitions. These criticisms have focused on; lack of inclusion of agency; unclear definition of regimes; bias towards bottom up change models; failings of its heuristic style; reliance on flawed data sources; the landscape level is a residual analytical category; the benefits of replacing MLP's hierarchical levels with a flat relationist ontology. This has informed debate and the progressive development of the MLP framework (Geels & Schot, 2007; Geels, 2010) with Geels (2011) responding directly to the criticisms highlighted here.

The MLP provides understanding of what transitions are and how they come about through a systems type approach, providing a single heuristic framework which is intended to fit all. However, nowhere in the MLP is there recognition of, or explanation of, the role of design. The act of design can be implied as an agency driven activity of niche and regime level actors, but this appears to take place hidden from view in the MLP. A designer wishing to inform their practice towards the creation and promotion of sustainable transitions will not find direct guidance from the MLP, but could instead gain a greater awareness and understanding of the context of their actions.

If transitions to sustainability are desirable and necessary for all, then we need some means to bring them about through regime level effort. Innovation projects that span the socio-technical, involving multiple actors and groups in society who learn about social challenges, have been described as 'transition experiments' (Raven et al., 2010). Strategic Niche Management and

Transition Management share the same theoretical background as MLP and are notions that have been developed to govern transition experiments and other activities such as visioning.

Strategic Niche Management (SNM) is “a tool to support the societal introduction of radical sustainable innovations” (Mourik & Raven, 2006). It has been used to both understand the role of niches within historical transitions, and promote niche level activities deemed preferable within on-going transitions. In the latter case the management actions look to combat the barriers presented by the hegemonic socio-technical regimes. To this end, SNM aims to create protected spaces which enable the development of technology from initial concept to something of obvious use (Kemp et al., 1998). SNM activities which support these aims are the promotion of communication between local actors and influencing policy to the benefit of the emergent technology.

Transition Management (TM) looks to govern transitions into socially desirable directions. It aims “to work towards a transition that offers collective benefits in an open, exploratory manner” and to that end, has objectives and future visions which are determined socially (Rotmans et al., 2001). The concept of TM is rooted in complexity science and governance studies (Grin et al., 2010), accepting that full control of transitions is impossible and instead seeks to manage through adapting and influencing a searching and learning process. Rotmans et al. (2001) identify several characteristics of TM: long term thinking to shape short term policy; thinking in terms of multi-domain, multi-actor and multi-level; focusing on learning-by-doing and in turn doing-by-learning; promoting system innovation alongside system improvement; and keeping options open. Transition management consists of the following cyclic, iterative activities (Grin et al., 2010):

- Identify problem and establish the transition arena
- Develop a transition agenda and develop a transition pathway
- Carry out experiments and mobilize networks
- Learn from experiments, guiding vision, agenda and networks

Within this description of TM activity, SNM can be seen as technology focused and niche bound experimentation. In combination, TM and SNM have been used for transition experiments on a national level, assisting the development of low-carbon energy supply in the Netherlands (Rotmans et al., 2001).

However, the validity and approach of TM and SNM have been called into question. Shove and Walker urge caution in accepting that TM is necessary or even possible (2009), questioning when and where this management activity may actually take place. They also ask who undertakes TM and if these practitioners are aware of their role and preferred actions. Shove (2012) also suggests there is an over emphasis on new, emergent niche technologies within MLP and TM, leading to a lack of attention on the inevitable technologies in descent. She suggests the process of decline could provide knowledge around the transition process, whilst technologies replaced through historical transitions could provide a low carbon alternative for the present day.

In response to these criticisms Shove et al. (2012) explore the role of users within innovation. They invoke a practice theory of innovation which has been named Social Practice Theory (SPT). This theory focuses on civil society and its influence on change through practice. Here a practice is defined as 'a routinized type of behaviour', made up of interconnected elements specific to that practice. These elements are competences, materials and meanings. SPT focuses on 'practices as performances', which represent the everyday physical 'doing' of the practice, as opposed to 'practices as entity' which is the abstract entity collectively referred to in discussions. It is the 'practice-as-performance' which re-affirms or potentially re-maps the relationships between the practice elements identified by the entity. In SPT's analysis of practice it is the individual practitioners that are the carriers of the practice, as it is through their performance and enactment of a practice that it is reinforced or changed. Shove et al. (2012) describe the role of practice on change over time, identifying stages in the development and breakdown of practices which are crucial to the innovation process (see Figure 2.6). In this model established practices emerge from proto-practices as both the elements of practices and the links between them are configured by the individual practitioner's performances. This development process works in

reverse for ex-practices as the links between elements are lost through lack of practitioner knowledge and re-enforcement.

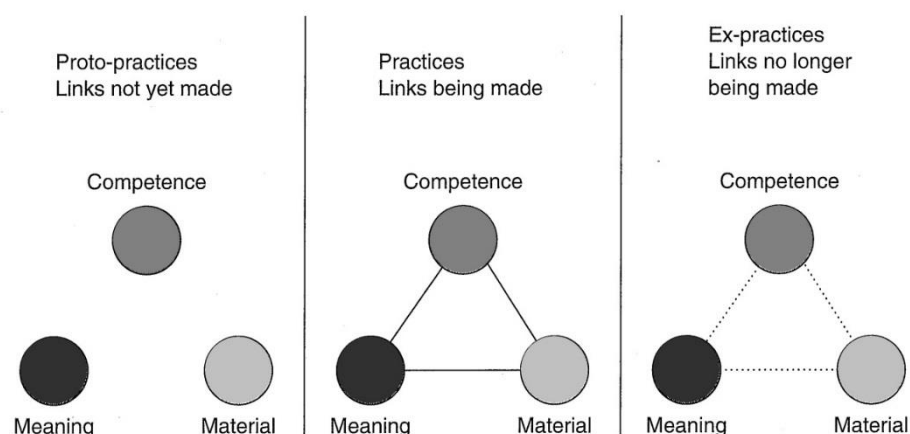


Fig. 2.6: Stages in the life of social practices, from Shove et al., 2012., p.35.

SPT represents flat relationist ontology, where actors interact to construct and configure practices that are intrinsic parts of the innovation process. This theory pays little regard to the theoretical levels at which the actors interact, though through the lens of MLP this could be seen to be at regime and niche levels. Both MLP and SPT provide informative academic perspectives of transitions built on different theoretical frameworks. Hargreaves et al. (2011) suggest that rather than conflicting these frameworks could work together to provide a better understanding of how innovations and transitions take place. They suggest that the points where regimes and practices interact (shown in Figure 2.7) could provide insights and leverage points. This premise was acknowledged and examined by Geels et al. (2016) in their assessment of the potential to combine MLP and SPT within integrated assessment models. They argue that full integration is not possible and propose that sequentially bridging between the different analytical processes would best inform policy makers.

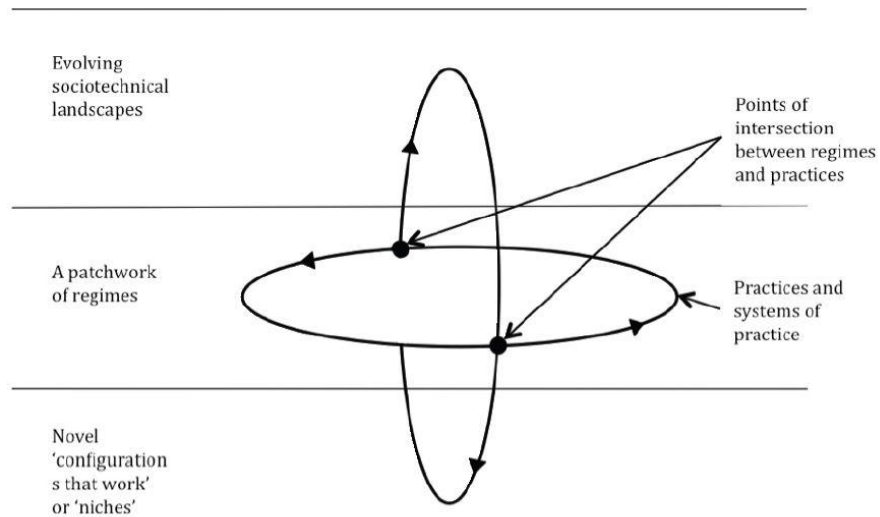


Fig. 2.7: Combining MLP and SPT, from Hargreaves et al., 2011, p.11.

Another way of looking at sustainable transitions comes from the Fluid Transition (FT) approach proposed by Guy (2011). This is different to the MLP and SPT, having its academic background in the applied discipline of architecture. Here Guy argues that while there is consensus on the need for sustainability, there is no agreement on how this should be achieved. A ‘heterogeneity of design strategies’ (Guy, 2011) are present, with the ‘meaning and practice of sustainable architecture the subject of much contestation between architects, policy-makers and public alike’ (Guy, 2011). Instead of adopting a universal technical hierarchy of strategies we should examine the manifestation drivers and diverse natures present in each built environment. Examining the associational power relationships which create the ‘socio-natural metabolisms’ of a place, will help recognise pathways to sustainability suitable to that place. To this end, Guy (2011) identifies four qualities which should frame design activities: Flexibility, Situatedness, Pragmatism and Participation. To each quality Guy (2011) provides guidance which has been summarised in Figure.2.8. Guy concludes that adopting the Fluid Transitions approach should “re-emphasise the ‘fluid’ potential inherent in all design innovation” (Guy, 2011).

Reflecting upon the Fluid Transition qualities and guidance, summarised in Figure 2.8, it is possible to examine how they relate to design; what questions they ask of design and how design practice can mobilize them. Firstly, ‘flexibility’ can be enabled by early stage design practice, with the

concept generation stage and the iterative nature of design promoting flexibility by maintaining openness to varied options. Secondly, ‘Situatenedness’ is helped by design through reflecting locally defined challenges in its specification. The ethnographic methods of inclusive design practices, which attempt to identify and understand users’ viewpoints and activities, can contribute towards this end. Thirdly, ‘Pragmatism’ asks us to deal with the challenge at hand. Here design thinking can both help identify what the important issues are within the situational context, while not having to react to universal rules or be led by normative decision making. Finally, the quality of ‘Participation’ requires that “voices beyond the architect/develop/investor nexus be heard and make a difference” (Guy, 2011), multiplying the representations of an issue. Participatory practices within design can be drawn from the areas of design thinking (Brown, 2009), co-design (Sanders & Stappers, 2008), inclusive design (Keates & Clarkson, 2003) and participatory design (Greenbaum & Loi, 2012). As many design specialisms seek to engage with participation the emphasis is placed more on methodological and theoretical applicability and effective delivery.

<p>Pragmatism</p> <ul style="list-style-type: none"> • Deal with the challenge at hand • Be open to multiple theoretical frameworks 	<p>Situatenedness</p> <ul style="list-style-type: none"> • More than just regionalism • Not dictated to by fixed spatial containers • Respond to locally defined challenges • Develop situationally specific solutions
<p>Flexibility</p> <ul style="list-style-type: none"> • Open to range of technical options, both high and low tech • Allow mixed up uses • Keep evaluative process open • Open to design possibilities, embracing interpretive flexibility 	<p>Participation</p> <ul style="list-style-type: none"> • Ensure voices beyond the normal nexus are heard and make a difference • Allow multiple representations of issues • Engage with the socio-materiality of place • Embrace notions of participative politics • Sharing the sweat with the citizens

Fig. 2.8: Qualities of the Fluid Design approach

The Fluid Transition approach, in acknowledging designs agency, has the potential to address the ‘How’ of sustainable transitions by directly informing the design practice. It is suitable to guide actions around an individual project, as it avoids universal dictums or one size fits all frameworks,

but falls short of identifying specific design methods or activities to apply. Moreover it suggests that a workable toolbox of approaches (including most notably from design) is required to stimulate and purposively shape transitions.

The approach also gives specific attention to the goal of sustainability and changes necessary to achieve it, as this is the driver for its inception. While the Fluid Transitions approach has been created in the academic arenas of architecture and the built environment, its focus on the shared act of creative problem solving, and avoidance of discipline specific issues and terminology, make it relevant and applicable to the wider design world. To that end the FT approach has been utilised to inform other research activities: Cook (2014) has examined how the FT approach could inform the design of more sustainable Product Service System by embracing diversity and addressing contextual challenges; and Jabeen & Guy (2015) have investigated how the FT approach could inform understanding of the adaptive spatial practices in built environments of informal settlements.

During the application of this doctoral research the issue of how design responds in practice to the challenges of Sustainable Transitions has developed in an educational context. The School of Design at Carnegie Mellon University is in the process of developing a Transitions Design (Irwin et al., 2015) approach, bringing together knowledge and discourses from outside design to inform and enable design practice. They use a Transition Design framework as a heuristic model to characterise four, “mutually reinforcing and co-evolving areas of knowledge, action and self-reflection”. These areas are: Visions of transition; New ways of thinking; Theories of Change; and Posture and Mindset. In summary, Transition Design holds the potential to identify a unique informed approach to design practice for Sustainable Transitions.

2.5 Discussion

This literature review has created a view of change, specifically, transitions to a more sustainable future and explored the role of design in these processes. It has been argued that sustainability is desirable but greatly different from our present state, with action to date producing little progress

in the face of continuous economic growth. Any change making meaningful progress towards sustainability would have to work against the institutional structures, social closed-mindedness and capital commitment to technology that locks us in to our existing unsustainable paradigm.

The review has also examined how design is a tool for change, both as a discipline and as a wider more inclusive 'design thinking' activity. In reacting to the emergent demands of environmental and then sustainability issues, design has continuously developed approaches which hold potential to bring about positive changes for sustainability. Whilst initially providing incremental technological change these approaches have developed along with understanding of sustainability until they now offer potential for real change for sustainability which encompasses social and behavioural change. However the development of these promising approaches is at an early stage, with no consensus on associated practice. The requirements of business continue to limit the role of design in making progress on sustainability. Consequently design practice is mainly limited to making incremental changes which produce gains that are well short of those needed to make change for real sustainability.

Design offers a decision making process that is more suited to achieving the disruptive change real sustainability demands. Historically decisions about change have employed the dominant scientific, positivistic decision making process. This process demands quantitative data to be gathered through repeatable experiments, so that definitive statements can be made to justify change. Alternatively and in addition, design decision making embraces creative, intuitive processes and values qualitative data. Through rapid iterations and embracing a trial and error approach, it might achieve significant change, with limited information. Due to the level of rapid change needed for sustainable transitions more design based decision making is therefore desirable.

In reflecting upon the academic frameworks of sustainable transitions, each has been found to have its benefits, drawbacks and research gaps. For example, the MLP explains what a transition is and how one might occur. The MLP is a persuasive framework with which to understand any transitions, as long as it is deemed acceptable to force identified phenomena to fit the framework

and allow emergent technology a dominant role. SPT is an equally plausible theory which gives society and social actions a dominant role in innovation for sustainability, but ignores the breadth and depth of connectedness in complex systems. Neither of these frameworks address design, either by highlighting design's influence upon constructed reality or promoting a role for design in bringing about sustainable transitions.

The Fluid Transitions approach (Guy, 2011) gives explicit attention to design in sustainable transitions. Grounded in the academic discipline of Architecture and the practical subject of the Built Environment it is concerned with the manifestation of physical solutions for technological and social issues, with design activity playing a central role. FT prioritises sustainability, and sets out principles to guide design activity towards that goal. FT specifically avoids prescriptive frameworks or universal theories; instead it acknowledges the plurality of definitions for sustainability and the unique set of characteristics that each project presents. It leaves out detailing the design practices which are to be directed by fluid transition and how they would be shaped by the process.

The emergent Transition Design (Irwin et. al., 2015) approach holds the potential to identify a unique approach to design practice for Sustainable Transitions, combining knowledge and discourses from outside design. Further development of the approach is required, along with research investigating its use in practice.

2.6 Conclusions

The focus of this research has been guided through the initial broad topics of sustainability, design and change, towards an appropriate gap in knowledge which this thesis addresses through its research questions.

The need for action at a global level is highlighted by the lack of progress towards real and meaningful sustainability. A desirable sustainable future will require massive changes to many complex systems, which are termed sustainable transitions.

The discipline of design has unrealised potential in energising progress to sustainability. While Design for Sustainability approaches create impactful disruptive change, design has mainly provided incremental change based around resource efficiency.

The majority of academic discourse on sustainable transitions serves to detail and explain these complex processes through developing universal rules. Alternatively, the Fluid Transition approach addresses directly the role of design in sustainable transitions and as such holds potential to guide design activity to that goal.

2.7 Research Gap

This research draws together an original mix of perspectives, from STS, Transitions and advanced design perspectives. The Fluid Transitions approach provides an interesting perspective on sustainable transitions that accords a key role to design, while design principles and practices associated with this framework are under explored. Thus significant insights may be gained on designing in sustainable transitions by drawing on the Fluid Transitions approach, addressing this gap in knowledge.

Table 2.2: Research Questions

Research Question	How can design, informed by the fluid transitions approach, promote a transition toward more sustainable infrastructure in the case of the BMK Waterway?	<i>Where are the questions addressed?</i>
Research Sub-question 1	What design practices are evident in the case study and how do they influence the infrastructure's future sustainability?	<i>Chapters 4 & 5</i>
Research Sub-question 2	Who are the actors within the case study informing design practice for sustainable transitions?	<i>Chapters 4 & 5</i>

Research Sub-question 3	What are the key elements of a sustainable transitions design practice?	<i>Chapters 6 & 7</i>
Research Sub-question 4	How can a fluid transitions approach be integrated within design practice in order to deliver effective sustainable outcomes?	<i>Chapters 6 & 7</i>

3 Methods

The purpose of this chapter is to present, justify and discuss an overview of the research methods used in this study. The specifics of methods are provided in the relevant data chapters. The chapter is divided into three sections. The first section examines the research design with specific reference to identifying the type of research conducted and strategy pursued in light of this. The second section provides an overview of how the research design was applied, and the final section considers the validity of the research.

Figure 3.1 presents a diagrammatic representation of the chapters of the thesis. The arrows denote data flows as they feed into and inform each other through analysis and interpretation.

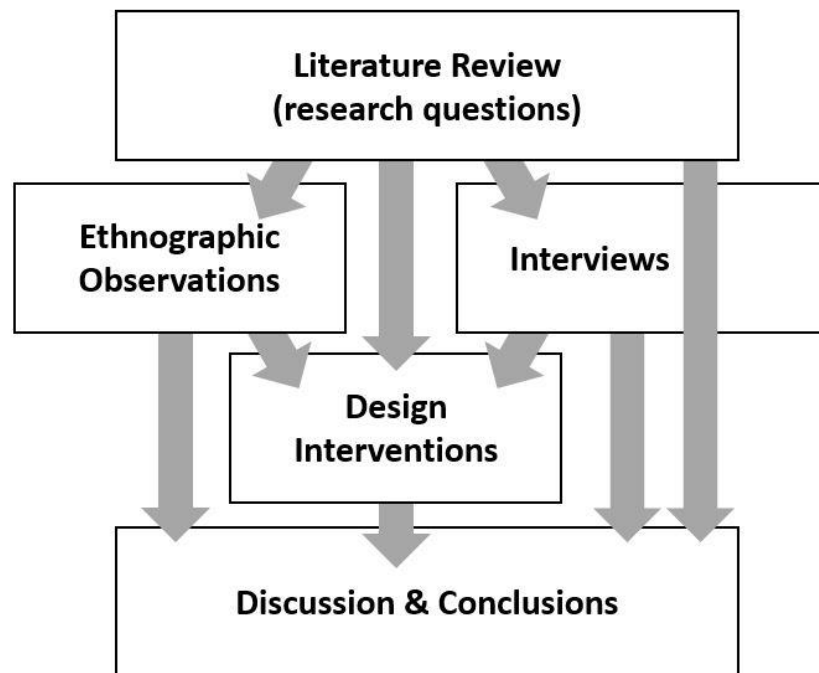


Fig. 3.1: Research activities and data flows.

3.1 Research Design

Research design involves examining the research questions in order to identify the type of research undertaken and appropriate methods for this task. As such the research strategy and associated methods for data collection and analysis are outlined. This process was conducted in

light of a number of key texts but broadly follows the approaches set out by Robson (2002). An overview of the research design process is represented in Fig. 3.2.

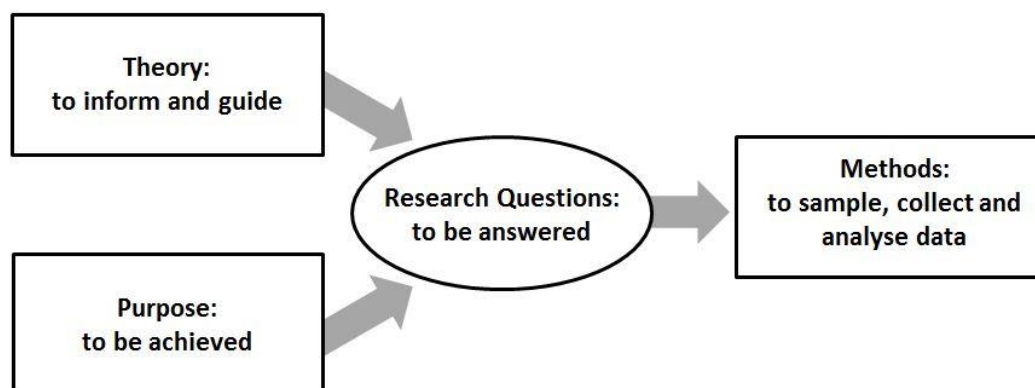


Fig. 3.2: Framework for research design (Based on Robson, 2002).

3.1.1 Research questions

The literature review (chapter 2) showed that there is a paucity of research that considers the contribution of design practice to sustainable transitions theory. The BMK Waterway project (introduced in chapter 1) provided an opportunity to conduct research to help address this gap in knowledge. By drawing on literature the following research questions were developed and addressed through research into the BMK Waterway. The research questions are generated in the conclusions of chapter 2, but summarised again here in table 3.1 to inform development of the research design.

Table 3.1: Summary of Research Questions

Research Question	How can design, informed by the fluid transitions approach, promote a transition toward more sustainable infrastructure in the case of the BMK Waterway?	<i>Where are the questions addressed?</i>
Research Sub-question 1	What design practices are evident in the case study and how do they influence the infrastructure's future sustainability?	<i>Chapters 4 & 5</i>

Research Sub-question 2	Who are the actors within the case study informing design practice for sustainable transitions?	<i>Chapters 4 & 5</i>
Research Sub-question 3	What are the key elements of a sustainable transitions design practice?	<i>Chapters 6 & 7</i>
Research Sub-question 4	How can a fluid transitions approach be integrated within design practice in order to deliver effective sustainable outcomes?	<i>Chapters 6 & 7</i>

3.1.2 Research Type

In order to develop an effective research design, it is necessary to identify what type of research is being conducted. There are many types of research. In order to identify the type of research undertaken, it is necessary to determine its purpose. Robson (2002) identifies three purposes of research:

- Exploratory – purpose to explore what is happening in a poorly understood situation and identify new insights. Often achieved through providing a different viewpoint or asking new questions of the subject under study, and is suitable primarily for flexible research designs.
- Descriptive – purpose to illustrate what is happening and provide an accurate description. Requires a good understanding of the subject prior to study, and is suitable for both fixed and flexible research designs.
- Explanatory – purpose to explain a situation or problem. Traditionally focuses on explaining causal relationships and patterns relating to the subject of study. Both fixed and flexible research design are applicable.

The purpose of research can be identified by examining the research questions. The research questions of this study show that the type of research is exploratory – it explores the design of future infrastructure and how that relates to sustainable transitions, which is poorly understood. Indeed, it provides a different viewpoint to other studies (Frantzeskaki et al., 2012) by using the

Fluid Transitions approach as a theoretical framework. However, while the research is exploratory, it has descriptive elements as it explores and intervenes within BMK Waterway development processes.

Fixed or Flexible Research Design

Having established the purpose of the research it is necessary to consider whether a fixed or flexible approach to research design will be pursued (Robson, 2002). Fixed research designs are usually theory driven, dealing with quantitative data and use experiments. Flexible research designs are exploratory and allow for data collection and analysis techniques to be determined during the study, often in response to findings as they emerge. Flexible designs are used when theory is underdeveloped and usually deals with qualitative data. A flexible design is therefore suited to this research given its exploratory nature and the need to adopt methods in the light of findings.

Type of Data Collected

Research history stems from early quantitative research activities conducted in the physical sciences. Today social sciences are also recognised as academic disciplines, and with them qualitative research types have been developed and legitimised. This history of academic research literature enables Cresswell (2007) to identify common characteristics of qualitative research, which are:

- Collects data from participants in a natural setting
- The researcher is the main instrument in gathering data
- Uses inductive analysis to develop bottom up themes in data
- Focuses on the meanings that participants hold
- Emergent (flexible) design informs later research phases
- Uses a theoretical lens to view the study
- The researcher presents their interpretation of what is witnessed
- Allows development of a complex picture of an issue

Development of the BMKW is a highly social process involving multiple actors. It is therefore necessary to develop a rich picture of a complex situation, of the BMKW, the role of design and phenomenon of transitions. This research focuses on design activity undertaken as part of this process which may influence sustainable transitions. Qualitative data therefore provides a highly suitable foundation of knowledge for this study.

Philosophical perspective

Ontological position: What is the nature of reality? - This research will examine a subjective reality of an ongoing infrastructure project, the BMK Waterway. This project has many realities, as seen by the different participants in the case study, what they want to create and what they think is going on.

Epistemological position: What is the relationship between researcher and that being researched? - I adopt a constructivist perspective, holding the belief that realities are constructed and that the researcher cannot be separated from that which is being researched.

Researcher position: Being involved inside the BMK project I had to be mindful of the impacts of my actions as a researcher upon the project, along with how my own perceptions and assumptions might influence data. I adopted the position of participant observer as a researcher. I engaged in activities alongside case study actors, making my status and intention known to them while attempting to limit my influence over them. My position as a researcher within the case study, along with the issues this raises and approach adopted in-field, is discussed in more detail in section 4.1 of the Ethnographic Data chapter.

Research Type Summary:
Purpose of research – exploratory
Fixed or flexible design – flexible
Type of data collected – qualitative data
Philosophical perspective - constructivist

3.1.3 Research Strategy

Having identified the type and purpose of research to be undertaken in the study, a research strategy was developed to effectively complete this task. A variety of research strategies are available. For studies based on a flexible design among others there are three main strategies available (Robson, 2002): case study, ethnographic study & grounded theory. These are considered in turn below and one is selected for this study.

Grounded Theory

This strategy is about generating theory from the data collected in a study. It is widely applicable and useful when the area of study lacks theory and concepts that explain or describe. Whilst a flexible design it has detailed data analysis and a theory generating methodology.

Ethnographic Study

This strategy seeks to capture, interpret and explain how a group of people live, experience and make sense of their lives and world. It tends to answer questions about the group or an aspect of their life. The researcher is immersed in the setting, often working in the field for long periods, in order to uncover cultural meanings distinct to the group and produce a detailed description (Robson, 2002; Hammersley & Atkinson, 1995). Consequently ethnographic studies are closely associated with participant observation, although the strategy is open to any applicable method.

Case Study

This strategy develops detailed knowledge about a case (or number of related cases). The case is a situation, individual or group, which must be studied in its context. Collection of case information can be through a range of data collection techniques including observation, interview and document analysis (Robson, 2002). In the case study the empirical data relies upon the researcher for collection. It is focused on a phenomenon in context and can employ multiple methods of data collection in the same study.

The main research question of this research is: *How can design, informed by the fluid transitions approach, promote a transition toward more sustainable infrastructure in the case of the BMK Waterway?* Thus the research necessarily involved engaging with a variety of processes associated with this on-going infrastructure project. Thus the case study strategy was adopted since it provides a suitable approach to study such complex phenomena which are situated and difficult to separate from their context. Further, as the research necessarily involved exploring an ongoing infrastructure project, the case study was longitudinal in nature.

Consistent with the canon of case study research, data were collected from multiple sources via multiple methods. Both the sources of data and data collection techniques are discussed below.

Sampling strategy

Since a flexible research design based on qualitative data was developed, a probability sampling strategy was not used. Instead, a non-probability 'snow balling' sampling strategy was pursued. Here the researcher identified actors associated with the case study. After interviewing them, they were used as informants to identify other actors who were subsequently used as informants in the study (Robson, 2002; Bijker, 1995). The snow balling sampling strategy can be viewed as a type of purposive sample.

Ethnographic observations used a dimensional sampling approach (Robson, 2002). This focused initially on the public dimension of the case study available to all participants, through attending public meetings and events, and accessing freely available documents. The research sought to open up the private dimension of the case study through gaining access to meetings and documents usually only available to project insiders.

The sampling for the design interventions depends on their nature and role in the case study. This should utilise the data obtained from participants in previous activities (interviews and ethnographic observations) to build a base, but also seek to introduce heterogeneous sampling to reflect the wide range of potential users of the future infrastructure. The latter group become

more relevant to design interventions involving which are open to the public, such as an exhibition.

Role of the researcher

Since the research was conducted from a constructivist perspective, which demands a reflexive engagement with research, the researcher adopted the role of participant observer. Robson (2002) identifies a continuum of approaches to participant observation: from complete participant to complete observer. Three approaches are identified as most applicable to real world research:

- The complete participant - The researcher participates whilst concealing that they are an observer, acting normally and seeking membership of the subject group. This approach facilitates access to closed groups and allows observation of unchanged behaviour. It is ethically and practically problematic due to a lack of informed consent from the subject, the need to record observations covertly and the potential for the observer to go native.
- The participant as observer- The researcher's role as observer is made clear to the subject group. The researcher participates in activities whilst observing and endeavours to develop close relationships with group members based on trust. This approach can stimulate group members to engage in reflective discourse and allows for informed consent from the subjects. It also has the potential to influence group behaviour due to known observer presence.
- The marginal participant - The researcher adopts the role of a largely passive participant (e.g. student in a library, passenger on a bus) who is able to observe unnoticed. The researchers' role as an observer is opaque, and while the subject group may be aware of an observer's presence, individual subjects remain unaware of the researcher's identity. The observer must adopt dress and behaviour suitable for blending into the subject group and area. Consideration must be given to maintaining active and open minded

observation, and how you are perceived by the subjects of observation. This approach only allows for general consent from the subject group.

Whilst the researcher's role remained that of participant observer the flexible research design meant that the focus of the researcher changed through the phases of the research (see Fig. 3.3). In phase 1 activity focused on understanding the case and thus the focus was on observing. In phase 2 activities involving interventions in the case and the focus was more on participation.

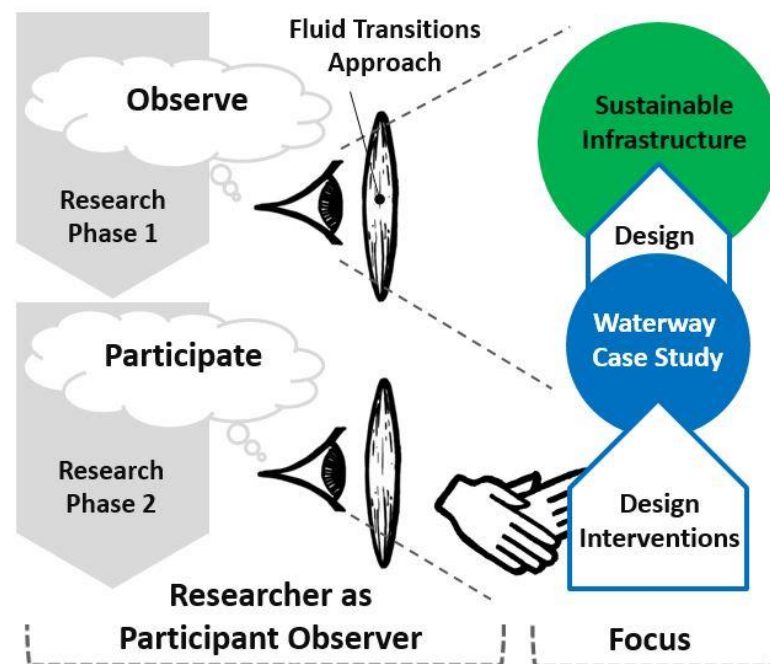


Fig. 3.3: Changing focus of researcher in relation to research phase and activity focus.

Data Collection

This sub section provides details of data collection methods used in the study and the rationale for their selection.

Observations

The role of the researcher as participant observer was discussed above. Participant observation requires the researcher engage in the social setting (in this case the BMK Waterway development process) and share their life experience (Silverman, 2005; Robson, 2012). Observational methods are used to observe what is going on in a given situation which forms the focus of research.

Observations were collected in a variety of ways including video, photographs, audio and research diaries.

Interviews

Interviews enable the researcher to ask people questions about the situation they seek to explore. Typically three types of interviews are used. These are differentiated by the degree to which they are structured: structured interviews, semi-structured interviews, unstructured interviews (Silverman, 2005; Robson, 2012).

- Structured interviews use predetermined questions, worded precisely and in a set order. Allowing no opportunity for the interviewer to react to the dialogue. They are appropriate for fixed research designs and little different to fixed surveys, apart from being taken in person and with all dialogue recorded.
- Semi-structured interviews use pre-determined questions, but allow for change to their order and composition based upon the interviewer's perceptions of what is most appropriate for the research at that point. This adaptability makes them suitable for flexible research designs and allows the interviewer to prepare for different interviewees and react to the emerging dialogue.
- Unstructured interviews require the interviewer to determine general areas of interest which guide their input into an informal dialogue with the interviewee. As such they require a flexible research strategy.

Given the flexible research design underpinning this study, along with the requirement to focus on specific topics whilst addressing very different interviewees, semi-structured interviews were chosen as most applicable.

Document Review

Documents in the research field are identified and assessed. Those found to be important, through type of content, use or lack of use, are analysed in more detail. This is not document analysis, which would be too detailed and unsuitable, but a top level analysis to place the

document within its research context and draw observations on its relational positioning and potential agency in the BMK Waterway.

Interventions

In addition to adopting a somewhat passive observer role, rich case studies can be developed when the researcher adopts a more active role as participant observer (Langendahl, 2012). Thus a research design was developed that included interventions, which would provide an opportunity for the researcher to adopt a more active role by implementing design activities within the case study.

Although the research design did not specifically employ an action research methodology, the principles of the action research approach influenced the research design of the interventions. Action research is based on cycles of planning, acting, observing and reflecting (Robson, 2002). Appropriate design practices will be developed and implemented in various interventions. The impacts of these design practices will be observed, both as they are being carried out and in the captured outcomes. In turn these outcomes will be reflected upon, including comments from participants, to provide further insights that inform development of subsequent design interventions.

A range of intervention options are available, such as public exhibitions and various interactive communications. Through such approaches, the waterway design could be brought to a wider audience, allowing them to engage with it and participate in design processes. This would address the Participatory and Situatedness qualities of the Fluid Transitions approach (Guy, 2011) by encouraging a wider group of people from the local community have their input captured and fed into the design process, exposing new locality-specific issues and solutions. Examples of this kind of design intervention would be: an interactive website that showed the waterway design along its route and allowed people to modify it and add comments; a school project where children draw what is important to them onto a large scale wall hanging showing the waterway as it passes through their local area.

3.1.4 Data Analysis

Details of how data will be collected in the study are given above. This sub section details of how data collected were analysed.

Qualitative data analysis techniques

Qualitative data will be collected using the various methods outlined above. While these provide a rich picture of the case study (Geertz, 1973), the main concern of data analysis is to provide trustworthy findings from a complex process (Miles and Huberman, 1994). Here, while words may provide rich descriptions they are different to numbers in that they have multiple meanings and are therefore to some extent ambiguous.

Coding and clustering

In order to address the challenges of qualitative data analysis a coding and clustering methodology will be pursued. This is a common approach to qualitative data analysis and is deemed to be valid by many authors (Miles and Huberman, 1994; Silverman, 2001; Robson, 2002). Miles and Huberman (1994) argue that data analysis comprises three interlinked research activities: data reduction; data display and drawing conclusions. Data reduction involves reducing a large amount of data into something manageable. The use of codes here will serve as 'bins' to organise texts generated from interviews and observations. Codes can be identified 1) in theory prior to data collection and analysis 2) from data that results in a code list being generated and 3) from a combination of theoretical perspectives and data collected throughout the study. The last approach was selected for this study: as the BMK Waterway case study unfolds theoretical insights would be generated from literature in light of insights generated from data collected.

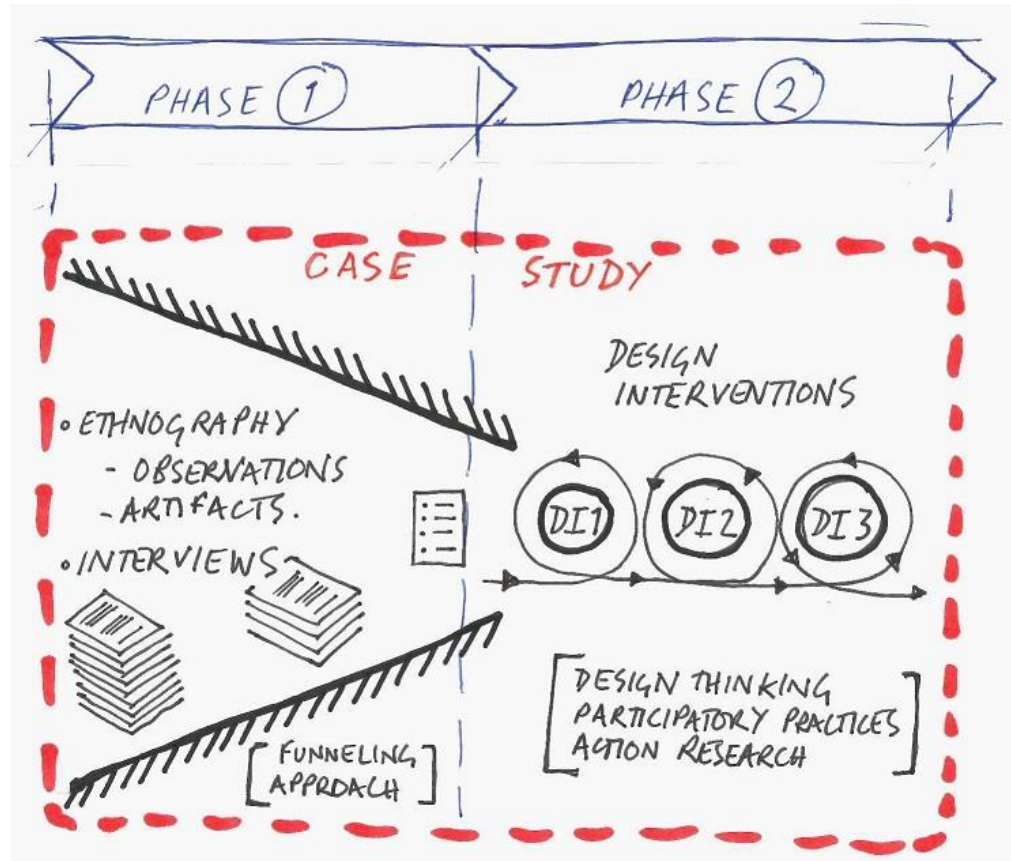


Fig. 3.4: Research strategy across phases, including research design theoretical approach

This research will adopt a funnel approach (Langendahl, 2012; Hammersley and Atkinson, 1995). Findings from the ethnographic observations and interviews will inform the nature of the design interventions. This approach was deemed particularly appropriate for the longitudinal case study strategy pursued. An overview diagram of the proposed funnel approach is presented in Fig. 3.4. Case study research activities are presented in two phases. Phase 1 gathers data through ethnographic and interview activities, reducing data to findings through data analysis in the funnelling approach. Phase 2 uses phase 1 findings to develop suitable interventions, and undertakes the interventions in the case study. Interventions are an iterative process, with reflection and feedback from participants, informing the next intervention.

Research Strategy Summary:

Strategy – single longitudinal case study, of two phases.

Researcher role – participant as observer.

Phase 1: focus on observation

Observations – meetings and group activities, dimensional sampling (public and private), field notes, photos, audio recording, journals and event reports.

Interviews – semi-structured, snow balling sampling, written notes, audio recording and transcriptions.

Document Review – important documents identified in observations.

Data analysis – combining multiple data sources, coding and clustering, codes from theory and data, funnelling approach.

Phase 2: focus on participation.

Interventions – heterogeneous sampling, activities developed to fit research context, activities inform design practices.

Data Analysis - combining multiple data sources, coding and clustering, codes from theory and data, sequential with participant feedback loops.

3.2 Application of Research Design

This section provides an overview summary of how the research design was implemented in practice. Each of the data chapters (4, 5 and 6) includes a more detailed explanation of how research activities were carried out. References are made below to other chapter sections containing more detail.

3.2.1 Case Study

A longitudinal case study of the BMK Waterway was completed. I was situated in and participated in the case study, capturing detailed knowledge and a deep understanding of this complex social

phenomenon. A wide range of actor groups were identified in the case study and the BMKW Trust and BMKW Consortium seen to be the core actor groups. The Trust is a charitable organisation open to public participation and it is through this group that I engaged with the case study.

3.2.2 Ethnographic Observations

Ethnographic activities were conducted from January 2012 to November 2014, with a total of thirty six observational events attended. Initially observational activities were at public BMKW Trust events, including regular meetings, conferences, social events, waterway festivals and public talks. My participation in these events nurtured good relationships with the BMKW Trust and many actors. I was able to explain the purpose of my research, allowing them to see potential benefits for the infrastructure project and in early 2013 the Trust agreed formal consent to participation in the research. This enabled my access to private Trust events and attended meetings of the BMKW Trust board, Consortium and Steering Groups. Conducting the ethnographic observations helped me identify the case study actor groups and their relationships, along with identifying suitable interview participants.

Observations were taken using field notes, research journals and event reports. As the case study progressed these observations became more detailed and focused, due to the ongoing data analysis funnelling, interest towards specific areas and also the development of my skills as a researcher.

After in-field observations were concluded a relationship was maintained with some friendly participants through emails and telephone discussions, providing me with an understanding of ongoing case study activities. I was able to reflect upon how the research, particularly the design interventions, had influenced the case study activities, informing the discussion and conclusions.

3.3.3 Interviews

In total ten interviews of case study actors were conducted between March and July 2013. All participants were identified as suitable due to their knowledge of the BMKW project and

willingness to engage in discussions. Six interviewees were from within the core trust organisations of the Trust & Consortium, and four from the wider case study actor groups. This participant make up was enabled by snow ball sampling from ethnographic observation participants and choosing a sampling that would provide the greatest spread of viewpoints from different actor groups.

Interview questions were generated to address topics relevant to the research questions and issues emerging from the ethnographic observations. An interview schedule was created for each participant detailing the six main questions and sub-questions used as prompts. Both the questions and their order underwent changes to best suit a participant's specialist knowledge and positions. More details on the questions used and reasoning behind them is given in section 5.4.

Interviews were transcribed in their entirety by myself, providing an initial in depth look at the data. The interviewees were given the chance to check through the transcripts, but chose not to do so. A series of data analysis activities were carried out using coding, clustering, theme and template analysis techniques. Hard copies of the transcriptions were annotated with analysis codes, themes and comments. A transcript summary was created for each interview, bringing together the key comments and quotes therein. Finally a flexible template was created that brought together all the data analysis coding themes.

3.3.4 Document Review

In this case study documents reviewed included written reports, meeting agendas, meeting minutes, maps, posters and illustrations. Many of the documents included visual elements. The documents that became important through the data analysis were both contemporary (A-Z project delivery plan, Developers guides, Trust Newsletters, Trust Meeting minutes and Trust display posters) and historical (Lottery funding bid documentation, the Economic Impact Assessment and historical illustrations). Observations from the documents review are included in both the ethnographic section and the discussion, as relevant to the thesis narrative.

The reality of the case study context meant document sampling included an element of serendipity. Knowledge of a documents existence often came about through discussion with a particular case study actor, while access to a document might be subject to the trust of an archives gate keeper or the impact of poor historical project management.

3.3.5 Research Funnelling, from Observation to Intervention

The analysis of data from the ethnographic observations, interviews and document analysis were conducted both separately and in combination. The findings from these analyses were triangulated to substantiate their validity. This combined data analysis provided the funnelling process necessary to focus onto the most important findings. In this culmination of phase 1 activities the findings crystallised around the notion of a Waterway Park, as both a naming label used in the case study and a design vision that could promote the sustainable transitions agenda relevant to the infrastructure project. This finding was supported by the strengths and weaknesses of the project design activity exposed by the Fluid Transitions approach. These findings were taken into phase 2 and informed the direction and activities of the design interventions.

3.3.6 Interventions

The interventions, which are outlined in Table 3.2, were the main research activities of phase 2 and represented a change of focus for the role of the researcher, from observation to participation (please see chapter 6). They took the findings from phase 1 as guidance for a series of interventions within the case study, aimed at influencing the case study design activity. The interventions were aimed at influencing the ongoing waterway infrastructure project towards becoming a sustainable infrastructure contributing to wider sustainable transitions. The interventions followed an iterative format, each providing feedback to participants and opportunity for comments.

Five interventions were conducted between November 2013 and November 2014, and are described in detail within Chapter 6. The interventions were of three stages; engagement, design

and dissemination. Participants for the engagement and design stages were primarily previous participants of the ethnographic and interview research. Many of the feedback stage participants were new to the research, including a small group of influential Consortium actors and a diverse audience made up of a very wide range of case study actor groups.

Table 3.2: Overview of Interventions undertaken in research.

Intervention Stage	Date	Event	Attendees
Engagement	Dec. 2013	Engagement Event at Open University Campus	Trust Directors, Consortium organisation representatives (6 total).
Design	May 2014	Design Workshop 1 at Marston Vale Forest Centre	Trust Directors, Consortium organisation representatives and user group representatives (10 total).
	July 2014	Design Workshop 2 at Open University Campus	Trust Directors, Consortium organisation representatives (8 total).
Dissemination	Oct 2014	Event 1 -Consortium Meeting at Bedford County Council Head Office	Trust Directors, Consortium members (11 total).
	Nov 2014	Event 2 - Trust Annual Partnership Meeting at Bedford Corn Exchange	Trust directors, volunteers and members. Consortium representatives. Other case study actor group representatives. Invited guests, inc. MP with portfolio for Waterways. Interested members of the public. (Approx. 100 total).

The engagement event in Dec 2013 provided case study participants with details of the findings from previous research activities and provided them with proposals for the future design intervention activities. The goals of the event where to achieve recognition of the validity of these findings and buy-in for the design interventions. The engagement event reached six attendees, all

previous participants and key case study actors. There was general agreement with the research findings thus far, and the proposed focus of future intervention activities through a series of workshops.

The design stage interventions in May & July 2014 gathered participants together at workshops where they engaged in design activities related to developing more sustainable design visions for the project. All activities were informed by a range of literature, including design thinking and action research. Emphasis was given to activities that would fit the real world practicalities of the project context and ensure the capture of data in session ready for analysis and future feedback. Alongside designing and organising these interventions, my role in these workshops was as a facilitator. Workshop 1 involved ten participants and was held in a meeting room at the Marston Forest centre, a neutral venue along the proposed route. A series of activities encouraged participants to identify what a more sustainable design for the BMKW project could be. Through drawing, brainstorming, discussion and storytelling, the participants used their different perspectives to co-design a more detailed design vision. Workshop 2 involved eight participants and was held in a lecture hall at the Open University. Synthesised outputs from the previous workshop were presented as a possible design criterion, which the participants considered and provided feedback on. The participants were presented with existing design work for three different areas of the route, which they considered in the context of their newly developed design criteria. The visual communication of the project designs used format and style that emphasised issues and scales not usually discussed or considered. The workshop's format and content allowed participants to discuss topics outside the usual meeting agendas and provided project design related insights.

The dissemination intervention events in Oct & Nov 2014 presented back the interim research findings to a wide range of case study actors, and gained their feedback. At the Consortium Meeting the research dissemination was an agenda item, which took the form of a PowerPoint presentation and group discussion which lasted approx. 45 mins. All attendees engaged in the discussion, providing opinions which mainly supported findings, with some offering critical

reflection. Data was recorded using journal notes and an observational report was produced. At the Annual Partnership Conference the research dissemination took the form of a PowerPoint presentation by myself as a conference speaker and 30 minutes of questions from the audience, which both challenged findings and asked for more details on certain issues. Data was recorded through my journal notes and notes from other supportive attendees, supported by an observation report created post event.

3.3.7 Data Analysis

The data from the design interventions were of greatest importance in answering the research questions. The engagement data informed development of design interventions and the dissemination data provided both a review by case study actors and a chance to reflect upon the impact of research on the case study.

Data, within the design intervention activity, was drawn from multiple sources. In workshop 1 these were captured in the event, through drawings, post it notes and audio recordings. Visual analysis of the drawings provided text based codes. The future stories and participant discussions created text for analysis. Waterway Park criteria brainstorming created more segments of text which were grouped and clustered through the analysis process. In workshop 2 data were gathered from participant discussion captured on audio recording and later transcribed. To this was added data taken from the design display boards, which was both text based and a visual analysis of board mark ups. For each of the workshops the data was analysed using the Fluid Transition qualities and informed by findings from phase 1 data analysis.

This process of data analysis allowed for sequential review through participant feedback loops. Summary reports, waterway park design criteria and interim findings were provided to participants in design intervention activities for them to provide feedback. These observations fed into the data analysis process and allowed me to further reflect on the nature of the research findings.

3.4 Validity

This section reflects upon the limitations of the research and how this impacts on the academic validity of the research. It focuses on the limitations regards the data collection and analysis processes, and then examines how the research contributes new knowledge.

When Silverman (2005) asks ‘is this good research?’, he goes on to identify good research as “...thinking theoretically through and with data. Developing empirically sound, reliable and valid findings. Using methods demonstrably appropriate to research problems”. This section shows this has been achieved.

The in-depth case study necessitates choices of what to focus on and which examples to use. This is reflected in the focus on particular insights and what is being communicated through the thesis. Questions of validity must be asked of this process. Silverman (2005) considers how the choosing of exemplary instances over others should not just involve anecdotal cherry picking. He suggests that, as the researcher abstracts and summarises, alternative interpretations are lost. Both Silverman (2005) and Yin (2003) propose that validity is constructed through triangulation of viewpoints and the use of multiple data sources, along with allowing participants to review findings and provide feedback. For this research data sources were taken from ethnographic observations, interviews, documents and workshop outputs.

Yin (2003) also identifies the need to understand external validity, in identifying the areas and disciplines in which the research findings are relevant. For this research those areas include Design for Sustainable Transitions and Sustainable Transitions theory, specifically focusing on the design of infrastructure, with further applicability to the Built environment. Finally Yin identifies that the reliability of the research needs to be examined. Can this research be repeated, and will it give the same results? This thesis provides the necessary details and information for someone to repeat the research, however the temporal nature of the studies and the unique interaction of the researcher with the case study context means that it would be nearly impossible to wholly repeat the work. Equally anyone else attempting to undertake the research again may make

different assumptions or choices. However I believe that the assumptions and choices made were reasonable and that they are justified within this thesis.

3.4.1 Data Collection

The BMKW Trust's project archive was not well organised and things often appeared only when someone remembered to mention it. Other things were not available, being misplaced or lost. Accessibility to participants was often dependent on social introductions or recommendations. The Trust volunteers I developed a good relationship with through the research were willing to get involved, others did not make themselves available, and yet others avoided talking to me. Voices in favour of the waterway were loudest as they were the ones who had chosen to be at the BMKW Trust events I observed. Voices unsupportive of the waterway were not commonly heard in the case study, however two of the interviewees were chosen partly due to their lack of support for the project. Some case study actors spoke up about being unhappy with the direction or speed of the project at public meetings. While most of the public offered support for the project in conversation others were dismissive of the feasibility of the project. The lack of public engagement and participative practices undertaken by the Trust removed the opportunity for any dissenting, questioning voices to be heard. Choice of interview participants introduced voices who were neutral or critical of the waterway. These included representatives of the Internal Drainage Board, a Land Developer and a land caretaker charity. These voices described different ways of seeing the waterway and its issues giving a new appreciation of the range of realities attached to this project. They were important in informing the data funnelling approach towards case study insights.

What I focused on initially in the observations changed over time. Initial journal notes and observational reports changed to become less journalistic. Ethnographic observations started to include what I could physically see, some reflection on the subtext of activities observed and highlighted interesting language naturally occurring in comments, statements and conversations. Throughout I was aware of myself as a reflective researcher, learning the practice through doing.

The major case study data collection and analysis activities were relatively new to me, and although the research methods literature informed me of much, in the field pragmatic and quick decisions had to be made and lived with for the research to progress. There is no option to collect data retrospectively from observations that have passed. However, the case study was long enough and my development quick, so that I believe the ethnographic data I collected was robust, reliable and representative.

3.4.2 Data Analysis

The data analysis choices made in this research are believed to be valid. They successfully informed navigation through the different phases and activities of the research, informing how the research progressed. Whilst a single researcher's effort to analyse and interpret data, the use of multiple data sources, and review by participants, goes some way to addressing the potential issues a single viewpoint could cause. The methods used for data analysis varied, depending on the type of data being analysed, but more importantly as different techniques were trialled and adapted over time. The eventual use of the flexible template for the analysis of the interview data was a milestone in the research, as it provided me with better understanding and ultimately facilitated more rapid progress. On reflection the naming of some of the themes used in analysis made data analysis more difficult, but on the whole did not damage the data analysis process.

3.4.3 Contributions to Knowledge

This research is concerned with how design can help influence a transition to sustainability. The Fluid Transitions theory was drawn from existing literature on architecture and the built environment and applied to design activity in an infrastructure project. The discussion and conclusions of the research identify how the research can best contribute to the knowledge of these disciplines and sectors. Near the completion of the research academic literature presented a lack of understanding of how to implement sustainable transitions using design and the FT approach had not been used to guide design activity. This I consider validates the choice of research focus.

3.4.4 Ethical considerations

This research was conducted with due diligence to the ethical requirements of research involving people, following the guidance provided by the Open University. The guidelines included considerations of recruitment, consent, locations, data protection, payments, potential harm to participants and their debriefing. The main ethical considerations undertaken as part of this research were gaining informed consent without applying any pressure; providing participants anonymity through use of pseudonyms; and the IT security measures taken to protect their data. For the interviews and intervention workshops each individual participant was required to provide informed consent. An information sheet detailing the research activity and a participant consent form were provided (see Appendix A). Participants were given time to read these documents and ask questions prior to signing the consent form, or not, before research participation. Organisational consent was provided by the BMK Waterway Trust, allowing observation of many of their meetings and activities. This approach was proposed to the Open University Human Research Ethics Committee, gained approval and given research reference ID: HREC/2013/1380/Rowbotham/2.

A modification to the proposed policy on anonymity was made at the start of the interview process. After reflecting on the first few interviews, it became evident that total anonymity was not possible. The BMKW case study is a unique national infrastructure project in a specific geographical location, with no other national projects of its type in existence. Consequently any attempt to provide anonymity for the organisations involved would be futile, as they were a matter of public record, widely known and easily accessible. After conferring with supervisors and research ethics experts, a decision was made to concentrate on providing anonymity to the individual, but acknowledge the organisations involved by using their real names. The information sheet and consent form were updated to reflect these changes. This new approach to the research gained approval from the OU Research Ethics Review Panel, and participants who had already undertaken interviews provided retrospective consent to the change in approach.

4 Ethnographic Data

This chapter details the ethnographic research activities undertaken in the case study and comprises four sections. The first section details how ethnographic research was conducted, covering the processes of data collection and data analysis. The second section provides an ethnographic data narrative, describing the social landscape found in the case study and the observational sampling strategy. The third section describes four stories from the ethnographic data. Each story presents important aspects of the case study identified through analysis and interpretation. The final section summarises the ethnographic data and key findings.

4.1 Conducting Ethnographic Research

In this research ethnographic activities are the gathering of primary data from and about the case study. This involved being a researcher out in the field and observing and interacting with the actors of the case study. I immersed myself in the events in order to gain in-depth insights not possible to gain from the outside. I developed relationships of trust with case study participants, making my research goals and potential benefits clear. This enabled access to insider events and made participants more willing to open up and express their honest opinions.

I take a predominantly constructivist world view: the knowledge of participants their construction and there is no one objective truth. Thus participants may give different answers to the same question whilst believing theirs is true. Seen in this way, the goal of a researcher is to remain objective and not influence what is being observed. I believe that the viewer is bound to be subjective to some degree and merely by being involved with the case study the research is influenced. While researching this case study I made efforts to be objective and neutral towards the research, however I must acknowledge my own subjectivity. I have previous knowledge of, and a love for the UK's inland waterways. This meant I was at least sympathetic to the notion of creating the proposed BMK waterway. Whilst deep in the case study observations I found that I would sometimes catch myself saying 'we' and including myself with the Trust when presenting a question or engaging in discussion. However, this does not represent a complete lack of

objectivity. Rather I developed this mode of engagement in order to be accepted among Trust actors.

Across this research I have made my research activities and intentions clear to the case study actors. From the very first interactions with the BMKW Trust at a New Year social event in Bedford I introduced myself as an academic researcher from the Open University. At that stage I was scoping out the activities of the Trust and trying to identify actors involved by attending public events. Following approval from the OU Ethical Human Research panel for my research plan I was quickly able to direct a request for organisational consent from the BMKW Trust to the chairman and board. Our previous interactions meant this was a smooth process. Consent was granted, which in turn led to significant levels of access to Trust activities. I also made clear to participants in the field my researcher status and interests, so that they knew who they were speaking to and the possible implications of their actions, carrying research information sheets to observations which could be handed out to participants for them to read later.

In conducting ethnographic observations within the case study the focus of my attention changed over time. Following Robson's (2002) approaches to observation my research role in the case study was that of 'participant-as-observer'. However through the different phases of the research my focus changed from observation to participation. While participating directly in the case study through the design interventions workshops I maintained an observational role, if reduced. The ramifications of this were that I was seen as someone who could influence and had a valuable opinion, so participants started to ask me questions and request my input on subjects. In these circumstances I spoke from the standpoint I adopted in the workshops (detailed in Interventions chapter 6) whilst trying not to unduly influence the event I was observing.

4.1.1 Gathering Ethnographic Data

The gathering of ethnographic data was a gradual process that started in an exploratory way and became much more focused as data was gathered. Initial sampling was based on the availability of volunteers and BMK Waterway public events. As more knowledge of the project was acquired

and better access gained, the sampling became more focused and informative. The following section on Ethnographic Data Narrative presents details of sampling, covering important activities, occurrences and documents. This section focuses on how the data was gathered together and what form it took.

A research journal was kept throughout the research process, using notebook and pen. The journal was taken to ethnographic events and used to take field notes, and immediate post event reflections. The journal was filled sequentially, annotated by date, and over the course of the research four A4 notebooks were filled with field notes and daily research thoughts and workings. Figure 4.1 shows the journal notebooks in which ethnographic field notes were taken, along with a sample of the notes. The journal was used as my first reference for primary data, being searchable by date, to recall events or what had happened at a particular time. The field notes taken in the journal included written notes, seating plans, sketches, and interesting verbatim quotes from participants (or timing notes linked to audio recordings, allowing quotes to be quickly located). The case study landscape was noted, capturing descriptions of the environments where the case study activities were observed, such as a Trust Director's house, Box End Park, a Newport Pagnell church, the BMKW community boat, LA offices and a University lecture hall.

As the ethnographic research progressed from the formative stages I was able to identify and focus on the most relevant case study events, allowing me to start writing up reports on events and activities attended. These reports were created quickly after the event, while memories were fresh in mind, and followed a formal layout that developed over time. The reports were based on research journal notes, which were often written very quickly, and developed them to be more detailed and descriptive, including other factors that had come to the researcher through reflection post event, or notes drawn from audio recordings.

Initially I made audio recordings of events, considering this a good way to capture data for future reference and analysis. However it quickly became evident that audio recordings might not be that helpful. Recordings took a long time to process, whilst also unintentionally lead me to relax and take poorer observations at the event. Most importantly requesting to audio record an event

caused irritation among some of the case study participants, making them close up and become less co-operative. Consequently, while I initially intended to audio record most observed case study events, this quickly changed to only recording selected events when audio was absolutely necessary.

Many documents were identified within the project for review. These were both important historical documents from the project's past (e.g. previous funding applications) and those generated as the research was conducted (e.g. meeting agendas). The historical documents collected were those deemed important by case study participants and those found by the researcher as knowledge of, and access to, the case study improved. Access to historical documents proved to be very patchy, dependent on case study actor knowledge and on somewhat hap-hazard historical record keeping of the BMKW Trust and the Canal and River Trust (CRT). Photographs were taken during ethnographic research to provide a visual record of various situations. These visual records focused on the environment at events, people engaged in activities and display boards detailing project design information. The number of photographs was limited as requesting permission to take ones that included Trust volunteers often caused concern and resistance with the case study participants. In summary, ethnographic data was gathered in journal notes, observational event reports, audio recordings and photos.

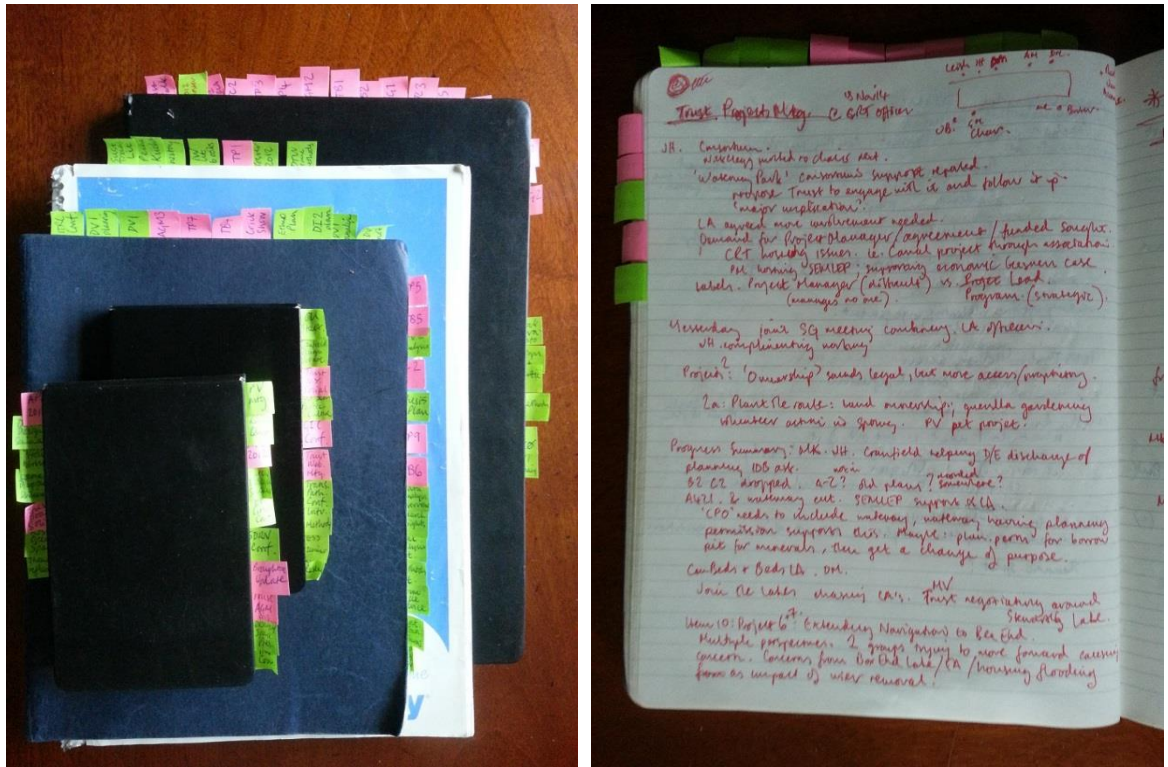


Fig. 4.1: Photos of research journals (L) and page of journal ethnographic notes for a Trust projects meeting (R).

4.1.2 Ethnographic data analysis

The analysis of ethnographic data was a continuous process undertaken throughout the three years that observations were made. Ethnographic data was created, reflected upon and added to the body of data previously collected. By following this cumulative process I became increasingly knowledgeable about the case study. At different points throughout the research it was necessary to take stock and draw findings from the analysis, to inform other elements of the research. In chronological order these points were: choosing which events to observe; deciding which documents to review; choosing interview participants; developing interview questions; developing the range of interventions; and choosing how to write up the ethnographic research in the thesis; and finally generating conclusions.

The analysis of ethnographic data started in the field. Being in the rich environment of the case study as it happened I had to choose what to observe and what was worthy of making notes about. In effect this was the start of a funnelling process inherent to data collection and analysis.

In such an immersive and longitudinal case study my memory of events was a major part of analysis. Ethnographic notes were mixes of both recording the key observations and facts, and provided a stimulus to memory so events can be placed in relation to one another.

There were multiple methods employed in the analysis of ethnographic data, in isolation and combination. Writing field notes was a start. Reflecting upon these and then re-writing to take them from journal into the observation reports constituted the next step. Data were coded and clustered to identify themes and their occurrence within observational reports. Drawing mind maps to identify themes in the data was another method employed. Eventually this fed into an analysis with interview data as part of funnelling down into research findings. Overlaid onto these were the Fluid Transition (FT) qualities as a lens through which to assess the data. To aid the analysis of ethnographic data it was also necessary to combine observational events and the themes emerging in the data, so they would make sense to a reader and provide a narrative taking them through the data.

The outputs of the ethnographic research process, gathering and analysis, are presented in the following section.

4.2 Ethnographic Data Narrative

This section provides an overview of the narrative found in the case study through the ethnographic research. It first places the case study within the timeline of the BMK Waterway project. As such, it provides a 'big picture' overview of the ethnographic research, describes how it proceeded, and details the major actors, actor groups, working relationships and activities found within the case study. Finally, ethnographic 'events and occurrences ' provides specific details of the number and type of observations made and the case study artefacts found.

4.2.1 Project Timeline

Infrastructure is one of the most long lasting things that humankind creates. More than industrial products or buildings infrastructure has the capacity to carve a lasting impact across generations, centuries, even millennia (Hadfield, 1974). Acknowledging this the BMK Waterway can be seen to

be an infrastructure project at the start of a long life. Whilst some actors bemoan the time taken to design and build it, this period is short in comparison to the infrastructure's potential lifecycle.

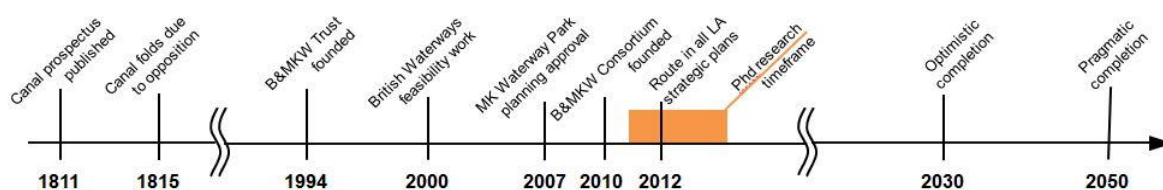


Fig. 4.2: BMKW project Meta timeline (indicative scale), related to research period.

The BMK Waterway project started in 1994 by a group of enthusiastic waterway users who saw it as a suitable Millennium project. Historically a canal was proposed for a similar route in 1811 (Hadfield, 1974). The contemporary BMK waterway has an estimated timescale of 60 years from genesis to completion, up to 240 years if you include the historical canal proposal. The timeline in figure 4.2 shows my doctoral research activities in relation to the creation of the BMK waterway infrastructure. It covers from the historical proposal for a Bedford Canal, to its contemporary re-emergence, through key events and includes possible future completion dates. Against this timeline the ethnographic research presented here can be seen to provide a very brief snap shot of the infrastructure project as a whole. The following ethnographic narrative will attempt to shed light on this brief period, to detail the waterway phenomena from within, as it is formed.

4.2.2 The Big Picture

This story begins in January 2012 with a visit to a New Year's social event held at a large Victorian house in Bedford. Here I first met many of the volunteers who made up the BMKW Trust, over a 'bring-your-own' buffet. Filling up the large house with bodies and conversation, I found the volunteers were welcoming. At 42 I thought I was probably the youngest there, as in general everyone was white, middle classed and retired. I contributed some home baked cookies and introduced myself as an Open University researcher interested in waterways. Attempts at networking were mixed. One man's reaction to the topic of a local Ecotown proposal along the waterway route suggested to me that we didn't share the same political views. Eventually I met a different group in the kitchen open to discussion, who I would later find out were Trust directors.

Our more expansive, in-depth discussion proved I was no charlatan, detailing my interests and potential volunteer skill set. Thus I was introduced to the members of the BMKW Trust (and was nearly roped into helping write their funding bids).

Over the next few months I started to attend public events, Trust Project group and Communications group meetings, alongside a talk to the University of the Third Age and the Trusts Annual General Meeting (AGM). I also attended waterway related events with a wider audience, where the BMKW project was presented to a wider audience of public and invited guests. These included the Trusts Annual Partnership Conference (APC), a regional Green Infrastructure Consortium conference and a local canal festival on the Grand Union. All these events helped me to better understand the BMK Waterway project, what activities were taking place and the range of actors involved in its creation. The two core actor groups were identified as the BMKW Trust and the BMKW Consortium, and through discussion with actors and examining case study documents I learnt information about both, which is summarized in table 4.1 below.

Table 4.1: Core actor groups involved in creating the BMK Waterway.

Name	Bedford & Milton Keynes Waterway Trust	Bedford & Milton Keynes Waterway Consortium
Founded	1994	2010
Aim	“to promote the BMK Waterway”	“to deliver the BMK Waterway”
Status	Charity, with donated/public finding	Working group of collaborating organisations
Members	<ul style="list-style-type: none"> • Chairperson • Directors • Volunteers • Project officer, on loan from LA 	<ul style="list-style-type: none"> • BMKW Trust • Bedford Local Authority (LA) • Central Bedfordshire LA • Milton Keynes LA

		<ul style="list-style-type: none"> • Marston Vale Trust • Milton Keynes Parks Trust • Canal & River Trust • Environment Agency
Working Structure	Internal working groups: <ul style="list-style-type: none"> • Board of Directors • Projects Team • Communications Team • Talks Team • Boat Team 	Internal workings: <ul style="list-style-type: none"> • Secretary (Bed LA senior officer) • Consortium Group • Regional Steering Groups (Milton Keynes / Marston Vale & Bedford)

At initial events I presented myself as an OU PhD student, interested in the waterway project for his research, attending as an observer and trying to understand how we might best work together in the future. At this stage I was still developing research questions, so in my explanations to the Trust actors I talked about the potential for my research around design, sustainability and participation, to contribute to the BMK Waterway project. The case study participants started to see me as a regular face at events and became friendlier, while I also started to understand how things worked within this group of motivated volunteers. Being recognised as someone with something interesting to say I was asked to contribute an article in the Trust Newsletter. Responding to a series of questions from the editor I wrote 'Designing a waterway for the 21st century', which was published January 2013 (see Appendix B).

In February 2013 I had defined my research questions and gained approval from the OU Human Research Ethics Panel. I had also acquired organisational consent from the Trust for it to form the focus of much of my research, which enabled me to more fully engage in focused ethnographic

research. I quickly identified and negotiated interviews with several of the key Trust actors, focusing on those who were knowledgeable and willing to participate. The interviews served as a lever to negotiate further access for ethnographic observation activities, notably Steering Group and Consortium meetings. It was through these meetings, which were normally closed to public, that I developed a deeper understanding of the case study activities.

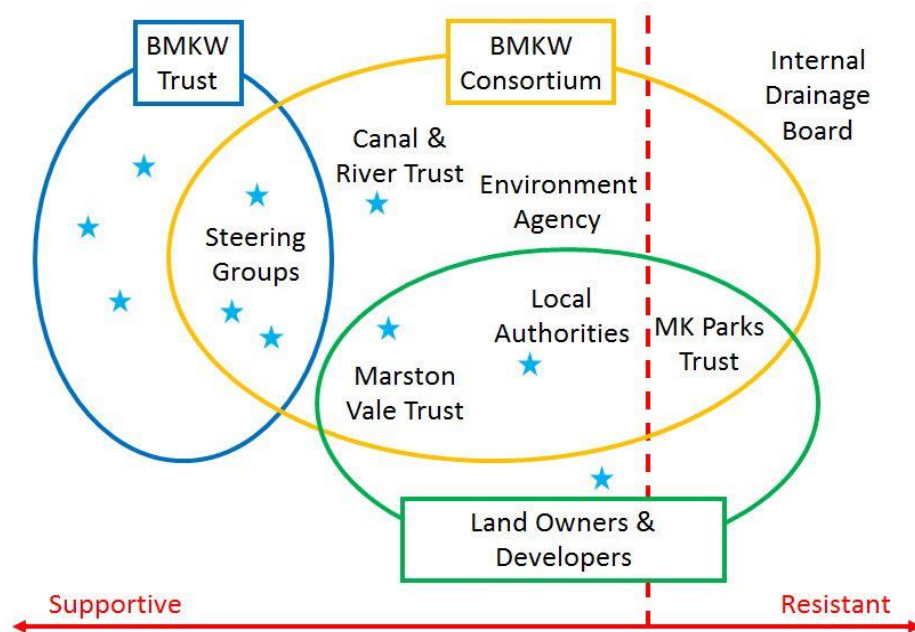


Fig. 4.3: Case study actor groups and their level of support (stars = interview participants).

Good observational access and focused interview conversations helped detail the wider range of actor groups in the case study. These groups included those outside the BMKW Consortium, but with interest and power over the BMKW project. Over time I was also able to identify the differing levels of support for the BMKW project among actor groups, from full support, through to ambivalence and outright resistance. These groups and their levels of support are communicated through the diagram at figure 4.3. The diagram also shows stars for indicative positioning of interviewees.

The wider BMKW case study actor groups were a mix of professionals (e.g. engineering, planning, and environmental) alongside Trust volunteers. Individual actors within the groups had differing levels of knowledge and skills, ranging from expert to amateur. The BMKW Trust volunteers were mainly older retired people, boating enthusiasts with an interest in the UK inland waterways, but

mostly amateur with regards to knowledge of how to create an infrastructure. The other actor groups involved were mainly populated with professional actors of a wide range of backgrounds and interests, many experts in supporting big capital projects. Notably the Trusts board of directors were predominantly regional professionals who had worked on the waterway project, then volunteered at the Trust to support it when they had retired. Consequently they had a good understanding of the professional context of a major infrastructure project and much of the expert knowledge required to make it happen.

The many land owners and developers along the route were an important actor group, as they had significant power over the project. They held a range of differing views about the BMKW project, most often representative of the alignment between their plans for land use and the waterway's need to pass through that land. Two important land owners involved in developing land through which the waterway may pass were O&H Properties and Gallagher Developments (referred to by case study actors as O&H and Gallaghers respectively). O&H Properties are a private business with property holdings across the UK and own significant area of development land in the Marston Vale, through which the BMKW route passes. Gallagher Developments is part of a larger investment group, for which they develop land for commercial properties. They own land on the southern outskirts of Milton Keynes through which the waterway route passes, and which Gallaghers are developing as a retail distribution hub.

Alongside the land owner/developer actor grouping there were also land caretakers. These were mostly public or charitable actor groups with legal responsibility for providing a caretaker role over land and ensuring it was used for common good. So they were less driven by economic gain and more concerned with local social and environmental benefits. Example land caretakers are the Marston Vale Trust and Local Authorities.

So what did I observe? As I started the case study observations at the Trust as a Community Boat was being designed by Trust volunteers, funding being raised and boat builders commissioned. This took up the majority of Trust volunteers' time and the main focus of Project meetings. As the

physical boat was completed the focus changed to managing the boat trip enterprise and the large volunteer effort that needed.

Alongside the boat activities the Project meetings involved technical discussion about the waterway route. These discussions focused on defining the route, identifying potential route blockages and land conflicts, alongside appropriate localised solutions. Attention focused on ensuring that any route side developments provided opportunities to help realise sections of the waterway. These routing discussions grew in length once the community boat was launched, taking the majority of meeting time. They were mediated by the A-Z Project Delivery Plan (BMKC 2014) a ubiquitous in-house publication that captured details of the waterway route in designated sections.

The waterway route discussion was repeated at every Trust Project meeting, with different actors reporting the latest news and progress, whilst also promoting their own design solutions. Indeed the same agenda item/discussion took place at Trust Board, Consortium and Steering Group meetings. However it was evident that the meetings represented varying levels of power to approve and implement action. In this matter the Trust operated by exerting tacit influence through informal networks, whilst the Steering Groups were empowered by the Consortium to push through action using their formal positions. It was notable that land owners and developers were absent from the formal design discussions observed, even though the waterway was likely to pass through their land.

Different types of design activities were observed in the case study. The waterway route discussions previously described were seen as a design process of negotiating and defining the infrastructure route, in which all actors contributed. Many actors engaged in a creative design activity generating a vision for the waterway infrastructure, through promoting waterway requirements, creating future narratives and using different naming labels. Design work was also undertaken to specify technical detail along short sections of the infrastructure. This was conducted by professionals (town planners, landscape designers and civil engineers) and mostly funded by land developers to fulfil their planning gain commitments. All these design activities

required further design work to capture and communicate the outputs to a wider audience. This design work mainly proceeded through established two dimensional mediums, such as maps, engineering drawings and to a lesser extent perspective illustrations of the waterway landscape. Throughout the course of the ethnographic research I repeatedly found it difficult to access historical case study design material. Documents would be missing or not available, and often I only became aware of historical activities through chance discussion with a long serving volunteer.

A wide range of artefacts/things were designed and created in the case study outside of a physical waterway. I have mentioned the community boat and the A-Z Plan already, but other objects were also important in mediating the design vision of the waterway. A pair of Developers Design Guides, the Trusts exhibition display boards, various maps, technical diagrams, talk presentations and newsletters all contributed to communicating the waterway design to wider audiences.

The only part of the physical waterway infrastructure completed at the time of the case study was a short section built as part of a recent infrastructure project to upgrade the A421 (which connects Bedford and Milton Keynes) to dual-carriageway. Here an underpass was built near Wooten Green providing both present day pedestrian access and a concrete channel suitable for a future waterway. This section was created through a concerted effort from both the Trust and Consortium to get the Highways Agency to recognise the strategic commitments of the local authorities to the waterway and incorporate a future vision into its design.

As research extended into 2014 the ethnographic activities ran alongside research activities of the design interventions (detailed in chapter 6). At this stage the ethnographic observational activities changed in nature. Alongside making objective observations of the case study activity it was necessary to influence the actors so they would see worth in, and contribute to, the design interventions. As this research is interested in design for sustainable transitions I also had to consider how the design interventions might change the case study, and their possible implications for the infrastructures pathway into the future.

In November 2014 I attended my final observational event when I delivered the final design intervention at the Trust's Annual Partnership Conference. While I interacted with the case study after this, it was through a more hands off approach of reading Trust newsletters and meeting minutes. I also talked to a couple of the research participants through emails and phone calls when we kept each other updated on our progress.

4.2.3 Ethnographic Activities and Occurrences

This section provides more detail on the ethnographic activities observed and artefacts found in the case study. A significant amount of time and effort was given to embedding myself in the case study activities and collecting ethnographic observational data. In total thirty six case study events were observed over a three year period, during 2012-2014. Some were re-occurring events, such as the Trust project meetings of which nine were attended. Other events were one offs, such as the Broughton Waterway Update.

The diagram in figure 4.4 provides an overview of all observed events to promote understanding of how they relate to each other over time. It provides a timeline, covering 2012 to 2014 by month, and plots all observational events. Re-occurring events are shown above the timeline, each event type is given a code (e.g. Trust project meetings = TP) and each occurrence of that event type is given a number (e.g. the Trust project meeting of Nov. 2013 being TP5). Directly below the timeline are the unique and irregular events which are named individually. At the bottom of the diagram are shown the time periods when the interviews and design interventions were undertaken. The observational events codes (e.g. TP5) are used in the following sections 'Stories from the Data' as an aid to the reader for placing observational events (and their data) in time and with relation to each other.

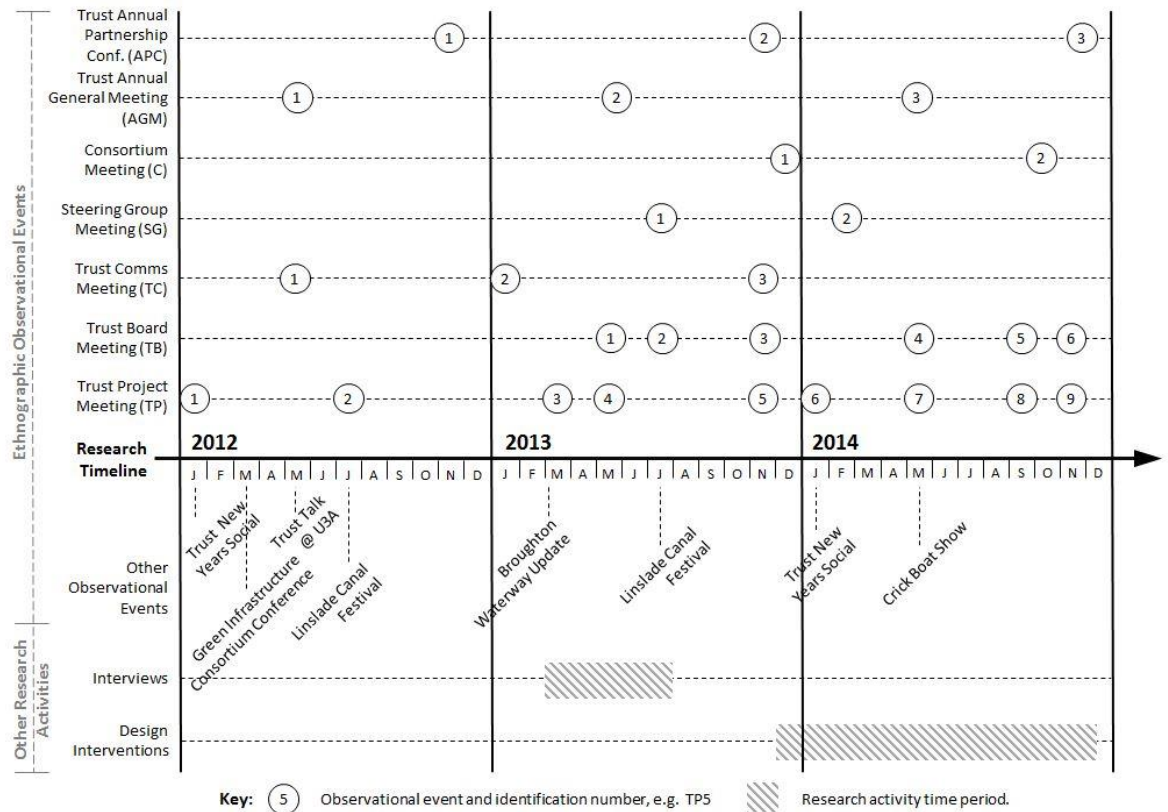


Fig. 4.4: Timeline of ethnographic observation events, alongside parallel research activities.

All these events have research relevant characteristics that can be identified, providing useful context and detail. These characteristics include how often they occur, who attends them and what records were created (both from within the case study and this research). Table 4.2 captures the characteristics of the recurring events and the most notable unique ethnographic events. The table also covers key artefacts from the case study which became important within the data analysis. Characteristics of the artefacts considered included their creative source, how often they were issued/updated/created, and where they were naturally found or used within the case study.

Meetings	Trust Projects	Trust Board	Consortium	Regional Steering Group	Trust Communications
Occurance	Bi-monthly	Bi-monthly	6 monthly	3 monthly	Bi-monthly
Attendees	Trust directors & volunteers, public	Trust directors	Consortium organisations senior management	Regional organisations senior officers	Trust directors & volunteers, public
Records	Agenda, Minutes, Field notes, Observation reports	Agenda, Minutes, Field notes, Observation reports	Agenda, Minutes, Field notes, Observation reports	Agenda, Minutes, Field notes, Observation reports	Agenda, Minutes, Field notes, Observation reports
Events	Trust AGM	Trust Annual Partnership Conference	Green Infrastructure Consortium	Broughton Waterway Update	Inland Waterway Shows
Occurance	Annually	Annually	Unique	Unique	Annual (2+/year)
Attendees	Trust directors & volunteers, public, speakers, guests	Trust, Consortium, guests, public		Trust directors, speakers, public, invited guests	Public, Trust volunteers
Records	Agenda, Minutes, Field notes, Observation reports, Trust Newsletter	Agenda, Minutes, Field notes, Observation reports, Trust Newsletter	Field notes, Observation reports,	Field notes, Observation reports, Trust Newsletter	Field notes, Observation reports,
Artefacts	A-Z Project Delivery Plan	Trust Community Boat	Developers Guides	Trust Display Boards	
Source	Consortium (via Trust)	Trust	Consortium (via Trust)	Trust (via URS)	
Occurance	Re-issued annually	Unique	V.1 may 2013, ongoing	ongoing	
Where	All meetings & Trust events, consortium website	Great Ouse, Bedford	Land developers, Consortium senior officers, Consortium website	Public events, shows & presentations	

Table 4.2: Most notable observed case study ethnographic occurrences.

Figure 4.4 and table 4.2 are provided here to both emphasise the scope of the ethnographic activity within the research and also provide useful levels of detail that can be referenced by the reader of the following section ‘stories from the data’, to provide more contextual information.

4.3 Stories from the Data

This research created a large amount of ethnographic data providing many insights, some of which fall outside the scope of the research questions. Many narratives can be identified in the ethnographic data. Four stories have been chosen (the rationale for choices is given below) to provide both an engaging narrative and the mechanism to communicate the highlights of data analysis:

- The Community Boat - looking at the BMKW Trust, the major group of actors driving the waterway project, through one of the key artefacts they have created.
- A Very Public Project – looking at the BMK Waterway project in a wider context.
- Defining the Route – examining on-going Trust activities.

- The Waterway Park – an emerging design vision of interest to the research.

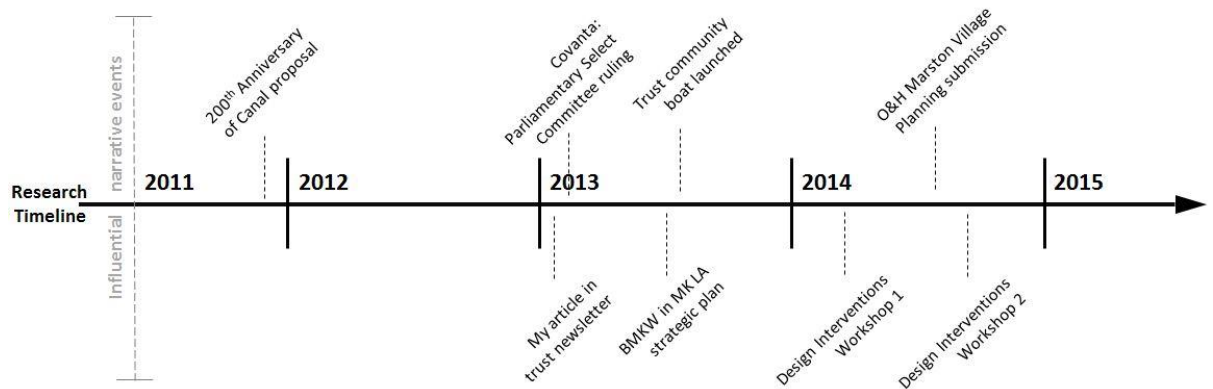


Fig. 4.5: Timeline of influential case study narrative events

The following stories will also make reference to notable case study events within their narrative. While not subject to ethnographical observational activities these events influenced the case study and associated activities. Figure 4.5 identifies these influential case study events, placing them within the timeline of the research. This timeline is again provided to inform the reader and in combination with ethnographic observational events timeline (figure 4.4) should provide an understanding of the overall temporal narrative of the research.

4.3.1 The Community Boat

This is the story of the Community Boat built by the BMKW Trust. It is also very much the story of the Trust and its volunteers, allowing us to take a look inside the Trust using the boat as a window.

Whatever floats your boat.

From the very first observation of a Trust project meeting it was obvious that the Community Boat was very important to many of the Trust volunteers. From 2011 into 2013 I witnessed the subject of the boat dominate meeting agendas. Many Trust volunteers put their time and effort into its creation. I listened to many meeting discussions about the boat. Could they get a full 72 foot wide beam around the planned route on the Great Ouse? Was it too big for the new Bedford top lock? What seating arrangement was the best set up and would it be able to take two school classes

together on one trip? I never witnessed questions about whether they should have a boat, only what kind, how to get it, and how quickly? They could tell you why it would be a trip boat, offering public tourist trips and available for private hire. The Trust was staffed by volunteers who liked boats and boating, and from their perspective this was what a waterway was all about.

This group of volunteers, gathered together around an idea to create a new waterway, focused their attention on building a new boat. They had taken the idea of the Trust running a trip boat and made it happen. Funds were raised through donations from people, organisations and businesses alike. The Trust presented their proposal to local authorities, convincing them of the benefits to the surrounding local community and managed to gain loans at favourable rates. Over several years they had created a business plan, accessed sufficient funds, agreed a specification, designed plans and were now commissioning Colecraft, a respected British firm, to build the boat.

Along with the practicalities of building the boat there was also the task of managing the business of its operation once completed. The boat needed a crew, to skipper the navigation, look after the passengers and prepare refreshments on-board. The boat excursions needed marketing, with river trips along three different routes, day hire, and even wedding cruises on offer. Alongside these tasks phones must be operated to receive orders and emails and twitter accounts checked. Volunteers were sought from within the Trust with the expectation everyone should be doing their bit (indeed several times I was put under pressure to volunteer myself).



Fig. 4.6: The BMKWT Community Boat providing tourist trips on the Great Ouse through the centre of Bedford town (Source: BMKWT, 2013).

In summer 2013 the boat started operation along the river Ouse around the Bedford area. The Trust had done it, and the 'John Bunyan' BMKW Trust Community Boat received a champagne VIP launch and much positive press coverage. There had been inevitable delays to schedule due to technical difficulties and volunteers had worked long and hard to have a couple of functional crews ready for service. Over the course of the case study annual reports showed passenger numbers were exceeding expected targets, making a profit and the boat was viewed as a success. The completed boat can be seen in figure 4.6 on a river cruise through Bedford town centre and crewed by Trust volunteers.

Giving the Trust impact

The boat is a big thing, indeed it is the main physical output of the Trust so far. As such it provides the greatest visible manifestation of the Trust to the general public. Choosing to operate the boat along the river Ouse through Bedford town, it is regenerative and as such brings tourist visitors and their expenditure to the town. It also brings more waterborne traffic to this quiet section of the Ouse, which at present is a cul-de-sac of the eastern inland waterways network. There was an aspiration often promoted in Trust meetings to push the boats excursions along the Ouse towards to the start of the proposed waterway. This would open up the navigation, making visible a physical move towards the theoretical. It would also influence the Environment Agency (EA), the organisation responsible for the River, to ensure it was navigable and conduct required dredging of the Ouse.

At the time of the case study the physical activity of building the waterway was not being undertaken. This issue was often raised, by the public at Trust displays and through questions at the Annual Partnership Conferences. When will the first section be built? With the answer unclear, but at least several years in the future, any sort of visible progress for the project was valuable. The boat provided that evidence of progress, and also importantly provided a focus for the activities of Trust volunteers. For many volunteers the chance to provide a meaningful contribution towards the waterway project was very important. The boat provided a focus for their efforts and kept them actively engaged, whilst also providing the Trust wider public impact.



Fig. 4.7: The community boat under construction at the boat builders (L) and at the Trust launch event for VIP's and volunteers (R).(Source: BMKWT, 2013)

What should the Trust be doing?

As well as providing benefits to the trust the boat also prompted the reflective question, is this what the Trust should be doing? While not articulated in the Trust meetings, outside the organisations it comes up for discussion. In the July 2013 Steering Group meeting (SG1) the Marston Vale Trust (MVT) representative raised that issue. He highlighted similarities between the Community Boat and their creation of the Forest Centre next to Marston Moretaine village. He recalled that the centre was such a success that the MVT came close to losing focus on their initial reason for existing and warned that with the majority of efforts funnelled into running the boat there was a danger of the same happening to the BMKW Trust.

Table 4.3: BMKW Trust stated goals and activities undertaken to achieve them (BMKWT, 2013).

Trust Goals	Activities identified supporting goal
1 Maintain and develop a strong Trust	Recruit members and volunteers, and succession planning. Seek office funding streams.
2 Ensure that the project is delivered	Progress key route sections. Maintain a planning watch and seek route

	<p>permission where not yet given.</p> <p>Work with Consortium, assisting and ensuring effectiveness, including updating A-Z Delivery Plan.</p> <p>Work with consortium to assemble shovel-ready route sections.</p>
3 Engage stakeholders and partnerships	<p>Carry out briefings to individuals and LA's, including through Annual Partnership Conferences.</p> <p>Develop community links based around Community Boat activity.</p> <p>Develop propositions for engaging more diverse and younger audience with project.</p>
4 Communications to engage every hamlet	<p>Continue program of walks, talks, displays, events, newsletters and media updates.</p> <p>Update website and employ social media.</p> <p>Develop communications strategy, inc. recruiting marketing and PR specialists.</p>
5 Projects to grow community involvement	<p>Set up and maintain Community Boat work.</p> <p>Identify suitable projects and support with bid-writing.</p> <p>Focused community engagement where needed.</p>

The Trust makes clear its mission to “promote and assist in the provision and maintenance of a new waterway and associated facilities and structures connecting the Grand Union canal at Milton Keynes to the River Great Ouse in Bedford, for the benefit of local inhabitants and visitors” (BMKWT, 2013). It translates this mission into a series of five goals which are referred to often and used to frame the agenda of meetings. These goals are given in table 4.3, alongside a summary of the activities undertaken by the Trust to achieve them. The goals are reviewed on an annual basis by the Trust Directors, with progress and priorities for action forming the focus of discussion.

For the Trust the community boat is primarily seen to be addressing goal 5: growing community involvement. However I had concerns as to how effectively it addressed this goal. These concerns were exemplified by observations at the Trusts 2014 New Years Social held on the boat at its Bedford marina mooring after the first season of operation. I mingled with volunteers who were basking in a happy atmosphere of achievement, chatting and munching on homemade meatballs. I found myself in a conversation with a volunteer who had shown great commitment by providing many hours of service on the boat, without knowing what the BMK Waterway was. To him the Trust and the social event were all about the boat. If this volunteer didn’t know that the boat was intended to promote the new waterway then surely the boats passengers could also be left unaware and ill-informed. I put this issue forward at the Trust board and project meetings. They assured me that passengers were informed of the BMKW project by the crew and leaflets, and that the Trust received monetary donations on-board. This didn’t reassure me, the crew would be distracted by their other tasks, the leaflets could become hidden and donations do not indicate why they were given.

In this case the boat project could be seen to take up the majority of volunteer’s time, while failing to deliver on its intended goal. Was the ‘community boat’ only paying lip service to engaging the local community and instead only serving a narrow community, those who were already interested in boats and waterways.

I put these concerns up for discussion at a Trust board level meeting. While the question of who was being engaged was dismissed there was a particularly pragmatic assessment from one director, who identified the important role the boat played in giving the volunteers something to focus on that they are interested in. Progress towards building waterway sections would be slow and a future activity, but keeping volunteer interest and engagement in the present was paramount. Meanwhile the boat provided this focus.

What are the volunteers capable of?

The Trust is made up of volunteers and they have achieved much, progressing the waterway project to its present stage and creating the Community Boat. There were a wide range of volunteers involved with the Trust, with different knowledge and areas of expertise. Generally though volunteers were of retirement age and drawn to the Trust as boaters or canal enthusiasts who could see the worth of a waterway themselves. The volunteers at Trust director level were slightly different in that a majority of them had been professionally involved with the Waterway project in their working lives as civil engineers, planners or council officers, appreciating its worth from this perspective and choosing to help when they had spare time.

In casual conversation volunteers often voiced concern over the Trusts average volunteer age and that they were glad a 'young chap' like me was getting involved. There was obvious concern that the project might lose momentum and 'die off' once the present volunteers were incapable to carry on. I was mindful that we were discussing an element of their legacy. It made me wonder whether the volunteer demography was a result of generational interests and if subsequent generations would care enough about the inland waterway network to continue to pursue the this waterway project.

The Trust was constantly looking for new recruits in order to address skills gaps and promote organisational growth. During the case study this initially focused on meeting the new boats requirements, but eventually focused on marketing, fund raising and bid writing skills, alongside acquiring new director level volunteers with good contact networks. While many volunteers had

given years of service I witnessed new volunteers join and quite quickly leave, often stating their frustration at the Trusts slow pace of progress and resistance to doing things differently. For example, in communications group meetings questions about the Trusts understanding of their current volunteer skills and knowledge came up repeatedly. The need to conduct an audit of volunteers was raised several times and eventually agreed upon. It took over two years for this item to move from discussion, to meeting actions, to volunteers receiving questionnaires.

The ability of this volunteer group to contribute to a complicated project were shown in the boat project. Difficult technical discussions were observed at the project meetings, with different volunteers trying to influence the boat's specification up to the last moment. This led to some volunteers becoming disenfranchised, not attending meetings and making their own decisions. However the levels of technical understanding and project management skills present in the trust mean they managed to deliver the boat for the start of the trip season with only minimal delays.

Once the boat moved into its operational phase the full extent of the continuing requirement for volunteer support was understood. The Trust was wise enough to understand that a reorganisation was necessary. A separate charitable enterprise company was set up and volunteers identified to take on roles within this group. This reshuffle included both directors and volunteers. The boat had become such a major operation that it was seen as necessary to separate out tasks and responsibilities from the Waterway Trust along with the financial arrangements for the boat.

The Community Boat - Summary

In many ways the Community Boat can be seen as representative of the Trust. It is a substantial task brought about by the significant efforts of motivated volunteers working together. It reflects an interest in boats and boating, and was focused on the water based functionality of the infrastructure. While aiming to address the objective of community engagement it fell short of engaging those outside its core area of support.

4.3.2 A Very Public Project

This section allows us to examine the BMKW project within the wider context, and ask: What makes it a unique infrastructure project? How do they work with others to make the project happen? How these factors influence interactions with actor groups outside the project core?

A Unique Proposition

The contemporary waterway proposal that is the Bedford & Milton Keynes (BMK) Waterway is a nationally unique proposition. Multiple projects exist to restore historical canals but this would be the first new waterway constructed in the UK for over 100 years. It is also an infrastructure project with an uncommon public genesis, not being initiated by business or government. In 1994 the waterway was proposed by a group of Bedford based actors as a suitable millennium project, gaining momentum and recognition to become the project it is today, written into local authorities' strategic plans and supported by national infrastructure organisations.

The BMK Waterway is not totally divorced from heritage. It would provide 'a missing link' to the national waterway network, as the Trust points out in marketing literature, connecting the isolated eastern network into a main traffic artery. There was a proposal to build a canal between Bedford and the Grand Union Canal over 200 years ago. Although this historical canal design was not realised, it is used by the current project as an engaging and legitimising touchstone for actors. The Trust presents the narrative of the historical canal proposal around solid engineering construction plans, willing financial backers and in terms of the socio-technical epoch of canal mania. Its failure to be built is presented as the result of interference by powerful local land owning gentry, their funding of negative reports and manipulation of the national press. This supporting narrative was observed in a public presentation from the Trust's Talks Team to the University of the Third Age in Milton Keynes, and further emphasised by the Trust's choice to host a celebratory dinner on the 200th Anniversary of the act of parliament enabling the historic canal proposal.

The Trust influencing others

The Trust's role in the case study is 'to promote' the waterway project, as acknowledged in the previous Community Boat story, and was observed in several ways. The Trust engaged in promotion activities to positively influence other case study actors, in ways that were visible to the general public and some which were hidden from its view. These efforts complement one another and in so doing have helped the project progress so far already.

The overt promotion of the waterway is by volunteers at all levels of the Trust and is carried out through open, public communications, and activities such as the Community Boat. It is aimed at the widest audience, from passing individuals, local interest groups and parish councils, through to council officers and national press. Examples of this visible promotion are volunteers attending exhibition displays at events (such as shown in figure 4.8, RH side), the production of newsletters which are sent to both Trust members and local community organisations, along with public guided walks along the waterway's proposed route.

The hidden promotion of the project's agenda is undertaken by director level volunteers. Many of the directors have worked in the local authorities involved in the project, providing them with unique knowledge of organisational workings and professional connections. Their activities are used to influence regional decision makers and those in powerful positions around key, often time dependent issues. These promotional activities were enabled by their access to actors in positions of power and the informal discussions this enabled.

A good example of both these ways of influencing others was observed at the Broughton Brook public information event. The event was organised by the Trust as a public meeting in Broughton where they would present to the community on the projects intentions, its progress and answer questions. The Broughton Brook sees the waterway route passing through a residential area and would require an existing watercourse to be heavily modified to be wider, deeper and include locks. The Trust recognised that the local community needed to be convinced of the waterway project's merits, so as not to see the waterway as negative change interfering with the status quo.

To this end the event was a great success with trust directors presenting to a packed audience of local residents keen to know more and asking probing questions.

There was also a largely hidden agenda for the Broughton Brook event. Over the past years the Milton Keynes planning department had been offering less and less support for the waterway project. This was contrary to their membership of the Consortium and previous approval of the designs for BMKW route through Milton Keynes. Once outline planning permission was awarded in 2007 all development plans for lands through which the BMKW route passed were legally required to accommodate the waterway in their proposals. However, recently a local commercial development had been allowed to threaten the viability of the waterways proposed route. A Trust director who had previously held a prominent position in the Milton Keynes LA was able to directly remind them of their responsibilities and strongly encouraged planning department personnel to attend the meeting. So the event also had another target audience, not obvious to the general public. Many of the MK LA planning officers attended, witnessing the level of community involvement and project support. This helped influence their future actions in support of the waterway and encouraged them to fulfil their roles as LA officers and members of a Consortium organisation.



Fig. 4.8: Trust volunteers receiving awards for the charities work (L) and promoting the BMKW project at a public show (R) (Source: BMKWT, 2010)

Perceptions of the Trust

The achievements of the Trust in progressing the Waterway project are widely acknowledged by other case study actors. The project has moved from its public genesis to become a strategic trans-regional project supported by all the local authorities, gaining millennium funding and winning awards in the process. The public nature of the project has helped it access volunteer resources and to lever assistance from local authorities. However it was observed that the same public nature of the project raised concerns with professional working on the project. They often held unfavourable perceptions of the Trust as a group of enthusiastic amateurs who did not understand or appreciate the professional requirements for delivering such a substantial infrastructure project. The approach to some aspects of the project by the Trust's volunteers often fell short of professional expectations. This was particularly noticeable in the following technical areas: environmental issues, water management and construction methods. The naturally occurring language volunteers used in the case study was a common indicator that they did not understand and were even dismissive of professional requirements. The criticism was focused on Trust volunteers but also extended to some director level volunteers.

Water Management

The proposed waterway will need a ready and continuous supply of water for its operation. However water resources cannot be managed for the sole purpose of the BMK Waterway as it passes through the landscape. The land surrounding the waterway includes many other water bodies, the features of which have come into being over centuries and are now critical parts of the geographical system. Rivers and streams have carried water for generations, watercourses and ditches have channelled water through land since it was farmed, and lakes have formed in abandoned holes in the ground where once clay was extracted to make bricks. The rivers, streams and watercourses are collectively managed by organisations, such as the Environment Agency (EA) and the Internal Drainage Board (IDB), to allow water to safely flow away from the landscape, towards bigger rivers and eventually the sea, in order to avoid dangerous flooding. However the proposed route of the Waterway crosses eleven different watercourses, potentially interrupting

their flow and function. The extent of this issue is illustrated in figure 4.9, created using technical maps from the IDB as a visual base, it shows the Waterway route (a purple dashed line) against the landscapes drainage watercourses (in blue).

The Trust actors largely look to the lakes in the Marston Vale as evidence of water available to use in the waterway. They do not appreciate or acknowledge that the purpose of the lakes and surrounding drainage watercourses are for flood prevention, and they dismiss flooding on canals as an issue. For instance in a Trust project group meeting (TP5) discussion turned to the issue of flood risk on the Broughton Brook, which was addressed in a recent technical report by the IDB. Several of the volunteers present challenged the IDB's assessment stating, "they just don't know their subject", and "you don't get flooding on canals it just overflows into local rivers", showing both a lack of knowledge around water management and dismissing professional experts in the area. This issue will need a more considered assessment from the Trust in the future as it is critical to the waterway's future operation, especially since the most elevated route section over Brogborough Hill will require a direct water feed.



Fig. 4.9: Interaction of existing drainage watercourses with the proposed waterway route, based on Internal Drainage Board mapping data.

Environmental Issues

Understanding the environmental issues of the site of an infrastructure build is a fundamental professional requirement for a project. An Environmental Impact Assessment (EIA) needs to be completed to understand what is already there and how it might be impacted by the planned project. The waterways proposed route passes through many different types of landscape, built up populated areas, industrial areas, agricultural land and reclaimed brownfield land. Marston Vale is of particular note as it was once a much industrialised area of clay pits and brick factories, replaced in part by landfill sites and then eventually projects for environmental regeneration through development of woods and parkland, through the efforts of the Marston Vale Trust. In the Vale there are many patches of boggy land which are home to Great Crested Newts, and it is an offence to disturb the habitat of this protected species.

As a whole, the Trust's responses to environmental issues associated with the waterway and its landscape were in conflict. On the one hand the natural environment was presented as highly beneficial, making the waterway offering a pleasurable passage through woodland, greenery and wildlife. This was tempered by dismissive comments and derision levelled at any environmental issues that raised complications for the waterway build. Trust actors were observed in project meetings introducing environmental "silly issues", without anyone voicing an opinion to the contrary. The Great Crested Newts resident along the planned route were a subject of particular ire, regularly called "those damn newts" and "bloody newts", with the suggestion of making newt pie emerging in one discussion. This organisational attitude is exemplified in the Trust newsletter headline (BMKWT, 2011) which read "Newts delay first dig", framing the environmental concerns of the area as adversarial to the waterway and promoting negative attitudes towards such issues in the Trust volunteers.

Many case study actors outside the Trust often had more sympathetic attitudes towards environmental issues, especially when this fell within their professional remit. Actors from Local Authorities, the Marston Vale Trust and the Canal & River Trust collectively argued that the completed waterway held potential to regenerate the land it would pass through, increasing

biodiversity and providing the newts' greater habitat. They were critical of the Trust's attitudes towards environmental issues, arguing that it lacked professionalism as the Trust needed to recognise the requirement for an EIA and associated remedial actions, which are legal requirements for large infrastructure projects.

Construction

Contemporary infrastructure projects employ civil engineering organisations using specialist technical staff and large plant machinery for the job. The waterway project is analogous in scale and complexity to contemporary infrastructure such as rail and road. There is a Trust wide acknowledgment of these realities, along with the need to adopt modern practices of building sections using modular pre-fabricated units. However there are also many volunteers within the Trust who actively push for the construction of the waterway to use a volunteer workforce to dig sections. This was observed in the case study with the AGM goal of a desire for "shovel-ready" projects and the organisation of a Projects sub-group to progress this. Some professional actors in the wider case study commented that this approach was seen as unrealistic and amateurish, doing little to support the view of the waterway as a credible project.

Several factors influence the belief that the Trust volunteers will construct sections of the waterway. Historically the canal network had been constructed by Navvies (whose name comes from the Navigations they worked on), itinerant workers who used hand tools and labour to complete the majority of earthworks. In the present day the Waterway Recovery Group (WRG) are a group of volunteers who work on-site to help restore derelict waterways. A romantic link persists in those that celebrate the canal network that they could recreate the Navvies role, referring to the WRG's activities as supporting evidenced. A volunteer dig of "shovel-ready" sections idea is promoted by powerful Trust actors and is a stated goal of the Trust in some documents. Once the Community Boat was operational the Projects Group was able to focus on other projects. A Trust director was appointed new chairperson for the Project Group and with them the agenda changed. The chairperson supported the volunteer dig agenda and pushed for a project to help develop "shovel-ready" sections of the route, focusing efforts on a section

between Stewartby and Brogborough Lakes with a 'Joining the Lakes' project. There wasn't a consensus for this activity, and it created conflict between volunteers as the ownership of knowledge and access to decision making was negotiated between parties. Political manoeuvring was evident in both the forming of a Projects sub-group, separating its critics from discussions, and the negotiation of a WRG spokesperson to present at the 2014 AGM.

The professional actor group response to the resurgence of the volunteer dig agenda was summed up by the comments of several attendees at the Steering Group meetings, stating that it was unrealistic, a "health and safety nightmare" and in danger of making the project look amateurish. For the Trust to carry out a volunteer dig, professionals such as civil engineers and landscape designers must first have assessed and agreed the technical aspects of environmental and water management issues, and have passed detailed drawings through planning departments. The volunteer dig of certain sections could only possibly be a limited activity within the planned scope of civil engineering and conducted under the auspices of the WRG.

A Very Public Project - Summary

The proposed BMK Waterway is a unique proposition, with no national equivalent over the last century. While many other projects aim to renovate historical waterways the BMK Waterway uses the history of its concept to legitimise it.

Trust activities influence actors through overt efforts undertaken for a general audience and hidden activities focused on key audiences. While the Trust director level volunteers ensure the latter is very effective, the former has a patchy level of impact.

The Trust is widely recognised for its achievements in progressing the BMK Waterway project and involvement in creating a credible and achievable project. However through the case study the Trust's attitude and actions in regards environmental, water management and construction issues falls short of the expectation of professional infrastructure actors.

4.3.3 Defining the Route

This section examines how the Waterway was designed (predominately the route) during the case study period. Design activities led by the Trust and Consortium and other actor groups were observed in various settings such as trust meetings. By observing these I was able to understand how design had taken place over time (prior to and in the case study period) in the waterway project, using information gained from historical projects documentation and conversations with case study actors in particular. A narrative of observed design activities was generated and is presented below.

Historical development of the waterway design

The initial design vision of the BMK Waterway was informed by several factors: the historical precedent of the 1800's canal proposal; the practical necessity of closing a gap in the national network; the current popularity of the waterway for recreational use; and the anticipation of Millennium projects funding.

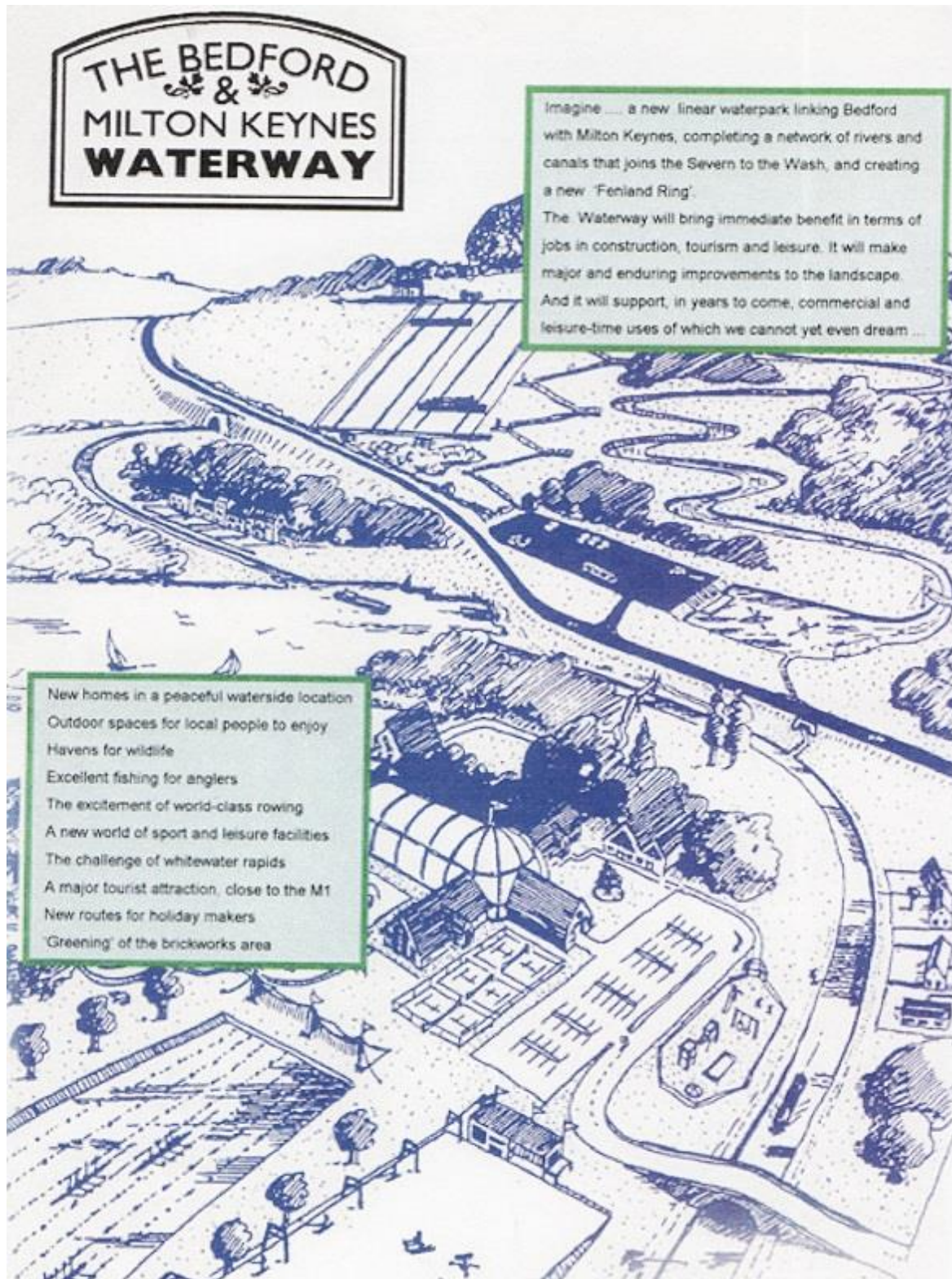


Fig. 4.10: Illustration of proposed Waterway from early in project timeline.

Earliest project design work took the form of discussion around the idea of a waterway, which over time became a concept articulated in various forms. Initially, the aim of key actors was to present an enticing vision of the waterway which would encourage people to get involved. However, the initial route was unclear and poorly defined. Much of the design work undertaken

at this time was not available as a result of poor record keeping. However, some early design work was observed as it was circulated among Trust volunteers and subsequently archived at the Bedford Museum. Looking through the work, some made little sense from my perspective; however an early illustration caught my eye, shown in figure 4.10. It provided a vision of the waterway passing over Brogborough Hill into the Marston Vale, showing a rich picture of a waterway integrated with many facets of life and being enjoyed by many people. Whilst the illustration lacked the sheen of photo realism, it nonetheless gave an engaging vision of a waterway which could be built in the future. Alongside the illustration was text pitching the idea of the waterway and the benefits it could provide. The text in figure 4.10 is difficult to read and is recreated below for ease of clarity;

Imagine... a new linear waterpark linking Bedford with Milton Keynes, completing a network of rivers and canals that join the Severn to the Wash, and creating a new 'Fenland Ring'.

The Waterway will bring immediate benefits in terms of jobs in construction, tourism and leisure. It will make major and enduring improvements to the landscape. And it will support, in years to come, commercial and leisure-time uses of which we cannot even dream...

New homes in a peaceful waterside location

Outdoor spaces for local people to enjoy.

Havens for wildlife.

Excellent fishing for anglers.

The excitement of world-class rowing.

A new world of sport and leisure facilities.

The challenge of whitewater rapids.

A major new tourist attraction close to the M1.

New routes for holiday makers.

‘Greening’ of the brickworks area.

Although the description of the waterway in this early project illustration resonates with the project observed in the case study, it is also subtly different. The description focuses on points appealing to waterway boat users, naming the Fenland Ring, and to local residents, naming the brickworks area, and suggests whitewater rapids as an integral feature. These points are at odds with the BMKW projects observed, which aim to appeal to a wider audience and be more professional.

As the project gained momentum British Waterways (BW) became involved, interested by the project’s practical merit and obvious growing support. BW tasked a senior officer to run a series of public talks with local communities and land owners in the area to promote the idea, sound out positions and open a design dialogue. Actors involved in this process generated six route options, all sharing a central route and offering three options at either end, i.e. Bedford and Milton Keynes.

A public exhibition, called the Citizen’s Jury, was held between 29th Nov. and 2nd Dec. 2002. Local people were invited to review and assess the six options and vote for which one they preferred. This process informed development of the current preferred route which broadly endures to this day. It is notable that little documentation is available on this process, just a few outline maps of routing options. In discussions at a Trust APC, I was informed by a professional involved in the Public Jury that the route choice had been politically driven to ensure it would pass through the centre of Milton Keynes. Thus the role of the public in the selection of the current route is ultimately difficult to identify.

Deciding on an outline route made the reality of the waterway nearer and the project more credible. Still largely pursued by volunteers the project suffered some criticism over its lack of professionalism. To address this concern a senior civil servant from the Department of Communities and Local Government (DCLG) was seconded to the project in 2008. Having experience of large scale trans-regional projects and their management he was able to engage

with land owners in a considered and professional manner. Through this process the project gained credibility and the route was further defined with the identification of a series of route sub-sections: sufficient to be denoted from A to Z. The map in figure 4.11 shows the waterway route and its division into sections, spread across the three regional local authorities, with Milton Keynes LA responsible for section A-F, Central Bedfordshire LA for G-M, and Bedford LA for N-Z.

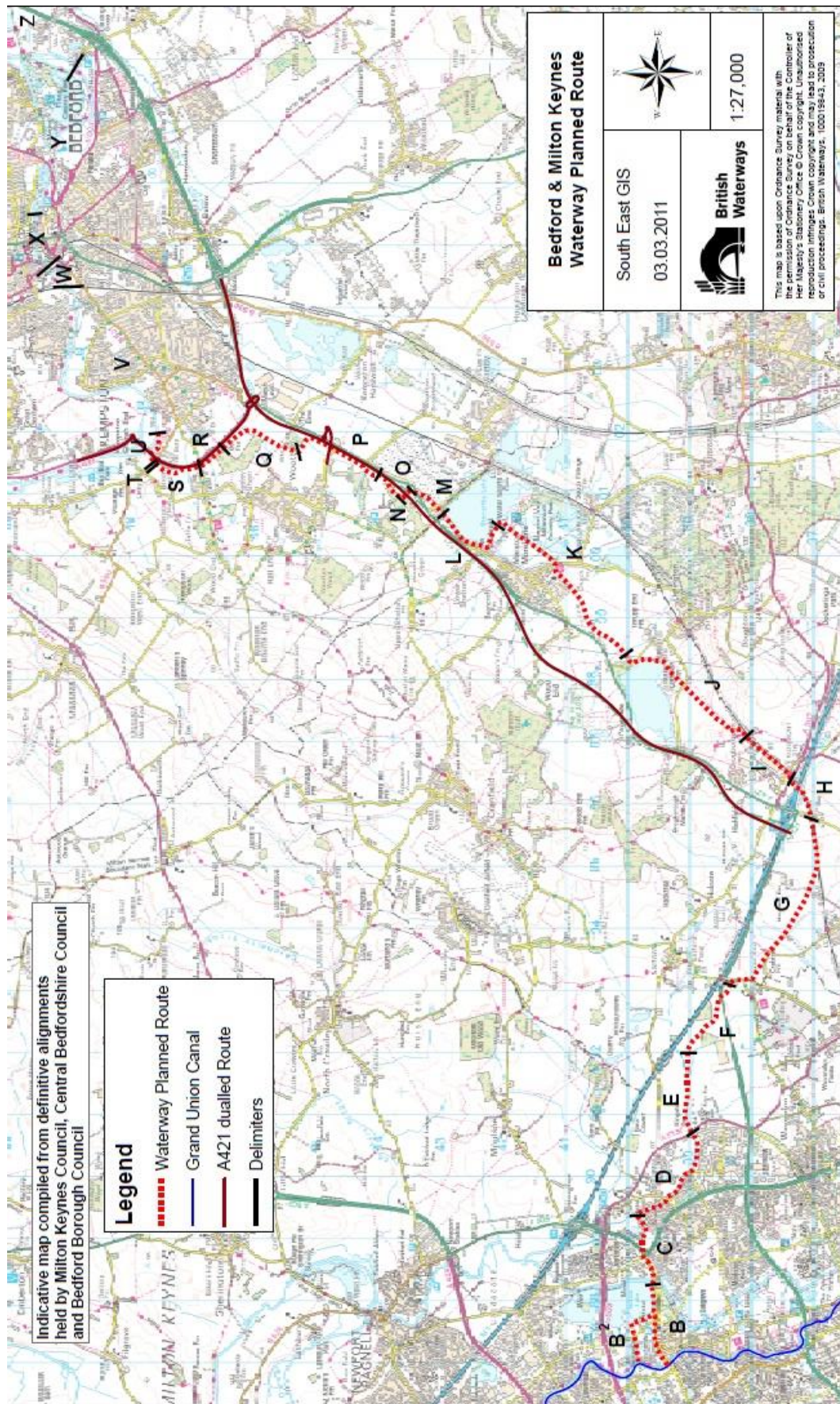


Fig. 4.11: Map of BMK Waterway outline route, identified by section. (BMKWC, 2016)

From the outset, actors argued that The Waterway could be a suitable millennium project. It was in the post millennium decade that UK national lottery funding became available. The Living Landmarks funding stream was a funding competition for regional UK capital projects that aimed to transform, revitalise and regenerate communities. The formation of the BMKW Trust, alongside the involvement of British Waterways and regional Local Authorities, meant that the Waterway was in a good position to bid for this funding. The BMK Waterway was shortlisted project and received substantial seed funding of £250k to develop a more detailed proposal. Professionals were employed to develop plans for an 18 mile section of the route through Milton Keynes. The proposal was named the Milton Keynes Waterway Park, the first time that the Waterway Park name was used in the project. Civil engineers and landscape designers prepared detailed plans and illustrations of the waterway covering both technical feasibility and design visions of its integration with the surrounding built environment. The Milton Keynes Waterway Park bid was submitted to the Big Lottery Fund in May 2007. Whilst ultimately unsuccessful in gaining further project funding the work for the funding bid was instrumental in the Milton Keynes waterway section gaining outline planning permission and represents the most substantial design work carried out for the project to date.

Current Pragmatic Focus

One objective in the Trust annual report was to ‘work with partners to construct the waterway in small sections over an extended time’, (BMKWT, 2013). This objective was a pragmatic response to the increasingly difficult issue of project funding, due to the National Lottery Landmark Projects fund closure and the post 2008 crash program of economic austerity . Consequently it was very unlikely the waterway would be built all at once, forcing the Trust to focus on making incremental progress where possible in the short to medium term. At the time of the case study this approach manifested in the following Trust activities:

- i. Securing the route.
- ii. Delivering progress through route side developments.

Securing the route recognises that any route blockage would jeopardise the whole project and seeks to stop this happening. The Trust worked to get the waterway project written into all the Local Authority (LA) planning strategies as this would afford the waterway route statutory protection within the geographical areas of the LA by making it a material consideration in future planning decisions. After a long effort, the Milton Keynes LA planning strategy (MK LA, 2013) was 8 years in the making, the Trust announced at their 2014 AGM that the BMK Waterway was written into all LA planning strategies. The Trust also kept a watching brief for any local activities that might negatively impact the waterway route and developed appropriate responses, which are detailed in the following section on 'Repeated Conversations'.

'Delivering progress through route side developments' was a pragmatic choice which could both help secure the route and build the waterway incrementally. All along the proposed route of the waterway adjacent land was being developed through housing or commercial constructions. Enabled by the LA planning strategies, the Trust sought for these developments to accommodate the waterway in the most favourable way. Such accommodations were usually sought through planning gains, where developers agree to provide a benefit to the LA for the common public good as a part of gaining planning permission. Planning gains that benefited the waterway took the form of the provision of funds for future construction, digging out a rough channel along the route and gifted land to be held by a LA for the waterways future use.

The remainder of the Defining the Route ethnographic story describes how the choice to focus on the two activities articulated above influenced the actions of different actors and ultimately the design of the waterway itself.

Repeated Conversations

The stories presented above describe the observed activities around the Community Boat and the volunteer DIG projects. Alongside these I observed the Trust engage in activities focused on securing the route. In this role they maintained a watching-brief on project progress and adopted a pragmatic approach to identifying and resolving problems as they arose. This was particularly

important prior to the waterway being written into LA core planning strategy documents, as route side property developments were not obliged to accommodate the waterway. The activities of the Trust to continuously promote the requirements of the waterway were very important in reminding and persuading LA officers and developer representatives of the waterway's potential benefits.

Maintaining a watching brief to secure the route involved a wide range of actors. Trust, Consortium and Steering Group meetings all had items on the agenda to discuss progress on the waterway route. Discussions about these agenda items focused on defining the route as well as arising developments which might threaten it. Information would be offered often from several sources, questions asked, debated upon, and then attempts made to identify localised solutions and agree courses of action. Variants on this conversation were repeated in all the meetings, with different actors covering the same discussions and not necessarily reaching the same decisions. Trust meetings were scheduled on a bi-monthly basis, following the same agenda and repeated conversations with slight changes in details and progress. The Trust project meetings involved enthusiastic volunteers and often heated dialogues that could take up the majority of meeting time, even though the Trust had little power to initiate desired action. Conversely the Steering Group meetings involved Trust directors and professional actors who had the power to make decisions and instigate action. These were conducted in a more neutral, business like timely fashion.

In all these meetings the Waterway route was discussed by reference to the sub-sections identified historically, which split the route into sections from A to Z (see figure 4.11). This discussion was conducted with reference to, and mediated by, the A-Z Project Delivery Plan (BMKWC, 2012). This document provided an initial overview of the waterway at a national and regional level, and introducing the A-Z sections concept across the whole route. The majority of the document is taken up by the provision of details for each route section in turn, such as the page shown in figure 4.12 which details section J of the route. The A-Z Project Delivery Plan was an A4 colour document of approx. 60 pages published annually under the auspices of the

Consortium, with most material contributed by the Trust and produced in-kind by URS, a supporting civil engineering consultancy.

Section J: Brogborough Hill to Brogborough Lake

Length:	2.2km
Local Authority:	Central Bedfordshire Council
Land Owners:	O&H Properties
Navigation Authority:	Canal & River Trust
Water Management:	Lead Local Flood Authority – Central Bedfordshire Council Land Drainage Authority – Bedford Group of Internal Drainage Boards
Planning Permission:	
Description:	This section lies in Central Bedfordshire, stretching from the tip of Prologis land and into Brogborough Lake. A potential Gateway to the Marston Vale to the East, the MK expansion area to the West and within two hours of half the population it represents one the most potent individual locations on the route. The engineering solution selected to tackle the 30m drop down to the lake will be critical to developing this section and to determine the footprint required – for not only the boat-lift but also the associated tourism / leisure / parking / information / economic / regeneration activity that will accompany it.
Current Progress:	<ul style="list-style-type: none"> Pursue work to visualise / quantify the potential Brogborough Hill engineering solution.
Next Steps:	<ul style="list-style-type: none"> Incorporate Brogborough Hill options into Marston Vale line and level commission to contribute to identifying the optimum location in relation to the Lake and existing settlements.
Partners:	Central Bedfordshire Council, O&H Properties.
Funding Status:	None.

Map Segment



Fig. 4.12: An A-Z Project Delivery Plan (BMKWC, 2012) page detailing section J of the waterway.

The A-Z Project Delivery Plan was the dominant object which informed the waterway design and was so ubiquitous in the case study that it was referred to as “the A-Z”. Whenever discussion of the waterway focused on a particular part of the route then multiple personal copies of the A-Z

would be put on the table and used as definitive points of reference. The A-Z focused on capturing technical information and cataloguing facts, assisting the reader with a portion of Ordnance Survey (OS) map showing a dashed line passing across it to represent an indicative waterway route.

It occurred to me that something was lost in the waterway's design only being represented in the boiled down essence of the A-Z guide. There was no reason why it should be, no enticing visions of the future that would engage a viewer; it only focused on how a functional wet conduit across the landscape could be built at some point in the future. For instance, the route section J shown in figure 4.12 details the waterway as it travels from the Marston Vale and passes over Brogborough Hill. However, this design illustration is somewhat bland in comparison to figure 4.10, created earlier in the project and covering the same section, which presents a much more inspiring vision of the waterway as it interacts with people in their locality in multiple ways.

Another activity of the Trust is promoting the waterway to the wider public and local communities along the route through displays and stands at local and regional shows. The Trust's Communications group identified an annual program of shows, which included many Inland Waterway shows along with local events such as the Marston Wood Festival and the Bedford River festival, at which a Trust presence would be useful for promotion and engagement purposes. At the shows, the Trust used a set of display boards that changed little over the case study period. The boards were constructed on modular panels, standing six foot tall and from nine to twelve feet wide, space allowing. The displays included a great deal of information and were built around a large central display of the waterway route across an OS map, which identified the route sections and linked to detail boxes of associated information. Another panel showed topography along the route using elevations. As a whole the display focused on communicating the route and associated technical information especially how problems would be overcome. Only one small image presented a vision of how the finished waterway might look when it was completed.

The A-Z document and the Trust's display boards suggest a focus on communicating the technical aspects of the route and project schedule for construction rather than providing public audiences with persuasive design visions. Although other more illustrative design work was available to the Trust, such as the National Lottery funded MK Waterway Park work, it was not used to engage with a wider audience and 'sell' a persuasive vision of the waterway.

The Power to Design

In the past funding has been available for the Trust to take control of the Waterway's design; commission professionals to develop waterway designs to favourable specifications. This can be seen as the classic design model for infrastructure, but is no longer available to the Waterway project due to lack of funding. Progressing the Waterway through route side developments is a pragmatic choice driven by project circumstances and may be seen as a rational choice that accords with flexibility and pragmatism embodied in the FT approach. However by progressing the Waterway in this manner, other actors have been involved in the design process, such as the land owners/developers, associated professionals and their agents. Taking advantage of the route side developments and using planning gain legislation to support the BMKW project ensures that the waterway is provided for, but also hands the power over design to actors who might not share the waterway's goals.

During the case study many examples of progress through route side developments were observed along the route, with varying results. In the following section four such developments are described. They represent different combinations of development, activities, actors, relationships and geography which result in quite different design outcomes.



Fig. 4.13: Detail of the design for the Marston Innovation Park, incorporating Waterway.

Marston Innovation Park.

The Bedford LA wanted to develop some of its land in North Marston vale for business use. The waterway route, at section P, was planned to run through the land parallel to a local dual carriageway. As the developer and a supportive member of the Consortium, Bedford LA had a good relationship with the Waterway project, were sympathetic to its goals and aware of its potential. Town planners produced an innovation park design that developed, embraced and celebrated the waterway, incorporating it as a central green and blue corridor, shown in figure

4.13. This design proposed a development which offered an improved environment, good visual impacts along important sight lines, raised property values and added access routes for pedestrians and cyclists. As part of this development planning, Bedford LA commissioned technical reports from civil engineers on how the local topography would influence the waterway design and created detailed designs of earthworks, including embankments and locks.

Wavendon Distribution Park

The owner of land around section F on the outskirts of Milton Keynes wished to develop it for industrial purposes. An application was made for planning permission for a distribution park, with warehouses supplying goods via trucks, taking advantage of local transport links. At this point in the case study, the MK LA planning department did not provide a suitable level of support required for a project with outline planning permission. The initial planning proposal for the distribution park made the route of the waterway potentially unnavigable. The issue came to my attention in the Trust Project group meeting of May 2013 (TP4) where one of the directors described how the developer responsible had a monopoly over that localities development opportunity. The Trust directors applied pressure on the Consortium and their MK LA contacts to resolve this issue favourably, to meet their 'Secure the Route' project remit. They also called in the help of a supportive local urban design group to provide alternative design solutions (on a pro bono basis) that addressed Trust concerns. The developers fought against the inclusion of the waterway in their design proposal and side-lined the waterway along a corridor of their land. The eventual design outcome required changing the waterway route to accommodate the compromise solution put forward by the developer (shown in the CGI visual in figure 4.14). Considering all these difficulties it was a surprise to find the developer as a sponsor of the BMKW Trusts Annual Partnership Conference (APC) six months later. This turn around could be seen as a move by the developer to make the best of a difficult political position, appeasing public opinion with regards to their treatment of this popular project.

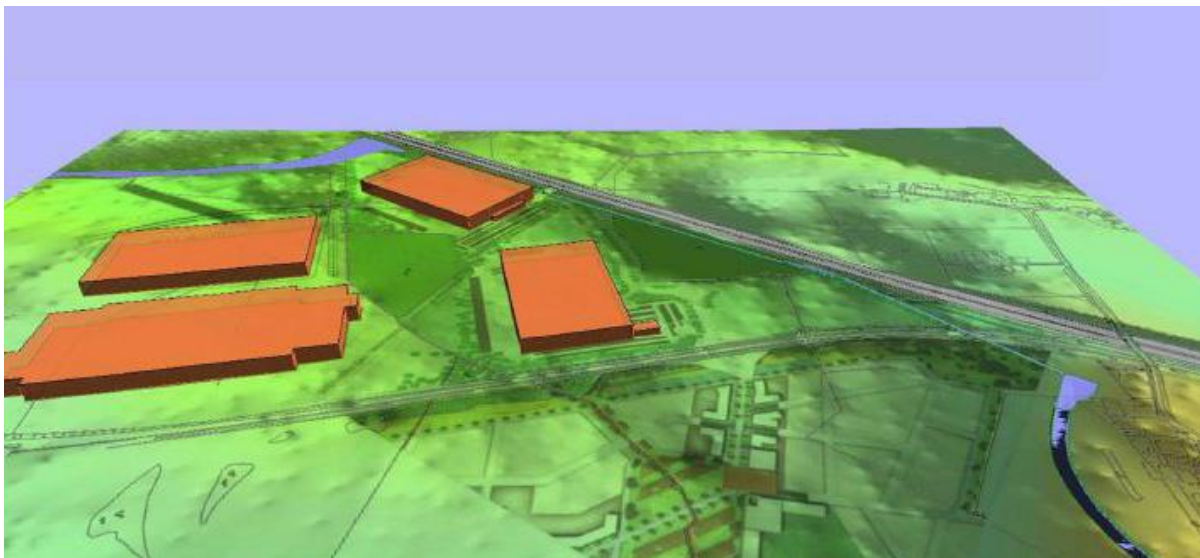


Fig. 4.14: MK Distribution Park development & alternative waterway route, digital visualisation.

(Source: David Lock Assoc. Ltd., 2013)

Stewartby Energy from Waste Plant

The owners of land around BMKW section M wished to develop their land with the building of an Energy from Waste (EfW) facility. However the developer submitted plans without any provision for the waterway route which passes through their land, and these were accepted by the Infrastructure Planning Committee. The accepted proposals were challenged by Central Beds LA in their role as BMKW Consortium partner. This challenge led to review by a Parliamentary Select Committee (PSC) which sought to understand the strategic importance of the waterway. The PSC required evidence that the waterway project was financially sound, deliverable, and had the support of professionals, the local community and elected representatives. The PSC found there was sufficient evidence of these conditions and determined there was a case to answer for waterway provision. As part of building their EfW facility, the developer then had to accommodate the waterway with the provision of two bridges and a channel across their land. These contributions were estimated a £2 million benefit to the waterway project, with the PSC ruling that the funds would need to be provided before the EfW could be completed.

This major achievement was celebrated by the Trust as validation by one of the highest review panels in the country that the Waterway was a “viable and credible” project. LA officers involved

noted that the experience gave all involved a good understanding of the types of evidence high level decision makers require and how to gather it, which would be very useful in future funding bids.

Willen Lake Routing

In early 2013 the Trust starts to propose a new design for the initial waterway route from the Grand Union Canal into Milton Keynes. This alternative route, identified as section B2 in the Project Delivery Plan (BMKWC, 2014), runs from the canal, through parkland and down into Willen Lake. It is promoted as providing a grand entrance to the waterway through a scenic green corridor and would require a long drop lock (a stand out feature on the UK inland waterway network). The existing B1 route, with outline planning permission, is a less aesthetically pleasing option, squeezing between a road and housing estate to reach the lake.

The alternative route, B2, was promoted within the cases study by influential actors, gaining acceptance from the Trust directors and most of the Consortium partners. This led to the B2 route being the focus of a bid for European funding through the South East & Midlands Local Enterprise Partnership. The land through which this new route passed was the responsibility of the Milton Keynes Parks Trust, an organisation that Consortium members rarely engaged. As the funding bid was submitted it became clear that the Parks Trust did not support this new route for the waterway. After heated exchanges between adversarial directors of both Trusts, the Parks Trust explicitly refused to allow the proposed route. Fortuitously at around this time the land through which the original B1 route passed had changed ownership. The new owners were keen to work with the BMKW Trust seeing economic opportunities from the incorporation of a marina where the waterway meets the lake. The Trust adopted a pragmatic approach and returned to promoting the original waterway route and its potential benefits.

Using only dialogue and rudimentary visuals a small but powerful actor group within the BMKW Trust had attempted to change the design of a section of the waterway to maximise its associated benefits. The eventual switch back to the previous 'inferior' design left many actors involved in

the process confused and disappointed. The political backdrop which influenced the change in favoured route were not made explicit, leaving the less powerful actors, such as the average Trust volunteer, slightly bewildered. Indeed one volunteer was so disgruntled they sent me an email highlighting the unprofessional practice this change represented and requested that I attempt to influence the case study. Aware of these unintended consequences a Trust director attempted to appease this situation in a board meeting by emphasising that the Trust must “not get obsessed with the best design, but focus on what is achievable” (Journal notes from Trust Board Meeting, July 2013).

Reflection and comparison of developments

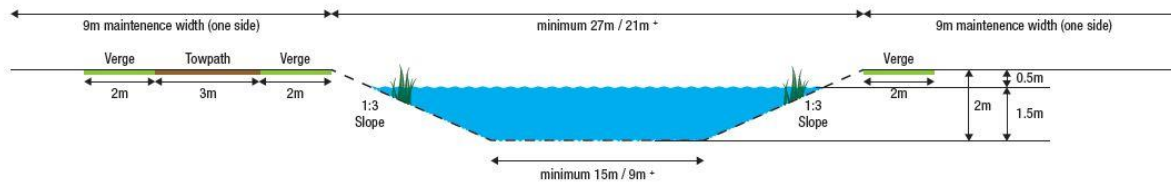
The Innovation Park sees the waterway design change from a straight line on a map to a detailed, curving route in the emerging landscape as a key feature. The Distribution Park sees the waterway side-lined onto the narrowest portion of their land possible, leaving little design choices and forcing further design changes in the surrounding land to accommodate it. The success of the waterway designs in these developments can be seen as aligned to the potential positive benefits that the land owners see the waterway offering their developments. Innovation Park units could increase in financial value as a result of the improved environment and office worker commuter access. However the Distribution Park, with its warehouse staff and rotation of truckers, saw no benefit from the waterway.

The Trust and Consortium recognised this issue and attempted to address it through the creation of a Developers Guide (BMKWC, 2013). This document attempts to communicate the value of the Waterway to developers, identifying an increase in property prices, increased aesthetic attractiveness to buyers and the provision of drainage requirements, as key benefits. It also sets out codes and practices that a waterway design must meet, along with key dimensional information necessary to understand the physical requirements of the waterway. The full document is provided in Appendix C, and a detailed drawing including key dimension data is shown in figure 4.15. While the aim of the document is well meaning and the information it provides pertinent and clear, the dimensional data could be seen by a developer as a list of

minimal requirements. It provides information suitable to the recreation of the existing inland waterways network, but does not allow for any alternate design visions.

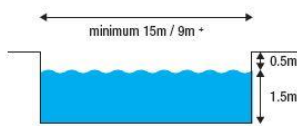
2. Elevations and Cross-Sections (widths, heights, depths)

• Open Aspect Waterway



• Vertical Hard Sided Waterway

• Two boat Width Waterway



• One Boat Width Underpass

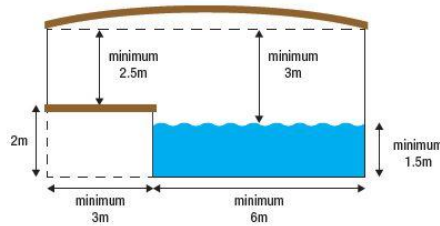


Fig. 4.15: Detail from the Developers Guide (BMKWC, 2013) showing key dimensional data of various cross sections.

The Trust strategy to progress the Waterway through planning gain from route side developments meant that the actor groups best able to influence the waterway design were the land owners/developers and their associates. When a land owner was unresponsive in providing for the Waterway within their designs then different avenues to gain positive outcomes were available. The outcomes of the Distribution Park and the Willen Lake routing showed that the Trust's reliance on other Consortium actor groups to fulfil requisite roles could leave the project at the mercy of unsupportive actors. In these circumstances the hidden influence of the Trust's contacts was not always sufficient to turn things around. While this approach helped enable a workable solution for the Distribution Park, it may have contributed to the negative reception of the alternative Willen Lake routing. The Trust and the Waterway project were strengthened by the eventual Stewartby EfW outcome, with a precedent from a high level decision, even if it represented a high level of risk at the time. The failure of the design vision for the alternative Willen Lake route is partly due to the Trust's reliance on design through dialogue. The ability to

better create and communicate these design visions can be informed by the next ethnographic data story, The Waterway Park (Section 4.3.4).

Defining the Route - Summary

Historically the BMK Waterway has seen volunteer led action, informed by public participation and assisted by professional project management, determine a preferred route and identify meaningful route sections. Many design activities undertaken before the case study was initiated have produced professional quality designs outputs, showing the Waterway to the Trust's specifications. This research found current activities for delivering the waterway were focused on securing the route against any blockages. The infrastructure requirements in the planning strategies of each Local Authority supported this goal by legally requiring any route side developments to accommodate the Waterway. Additionally regulations on planning gain often meant developers were required to contribute to the Waterway's construction.

Progressing the Waterways design through route side developments gives power over the design process to the developers. The resulting design outcomes are found to provide mixed results for the waterway, ranging from those which embraced and celebrated the waterway, to others which side-lined, compromised and even ignored it. Attempts to address this issue were observed in the production of a guide to communicate the benefits and business case of the waterway to developers. However the main methods by which the trust and Consortium influenced developer's designs for the Waterway were through persuasion, politics and as a last resort, legal action.

4.3.4 The Waterway Park

This section describes how different design visions were present within the case study. It gives details of how they were identified in the case study, what they represent, how this relates to the sustainability issue in the project and why some design visions might be more desirable for sustainable transitions than others.

Design Talking

The supporters of the waterway, actors from the Trust and Consortium, found it challenging to contribute to its design, to have their design voice heard and make a difference in delivering the project. Lacking funds to access professional infrastructure design activities, they are left to promote their ideas for the Waterway through discourse. Different ideas of what the waterway should be were shared by various groups of actors within the Trust and Consortium and this is reflected in the language used.

Language as design tool

Spending time in the case study I observed that actors used a range of names for the project. The Trust title for the project was the Bedford and Milton Keynes Waterway. Other shortened names were commonly used, specifically the 'Canal', 'Waterway' and 'Waterway Park'. These names were observed in use throughout the project, however many case study actors used one name exclusively in conversations and interactions. Examining the wider use of these names elsewhere, Canal and Waterway were found to be in common use, while Waterway Park was particular to this project. Different groups of case study actors used different names for the project. This was important as the choice of name, whether deliberate or unconscious, would label the project with a particular description. Indeed actors corrected themselves when they slipped into using a name they did not normally support. The following paragraphs provide more detail on each name, including definitions and how it was used within the BMKW project.

Canal, definition: "a long, thin stretch of water that is artificially made either for boats to travel along or for taking water from one area to another" (Cambridge University Press, 2016). This name applies specifically to artificial, artificial water channels. As no significant new water channels have been constructed for over 100 years the name is relevant to the historical part of the national inland waterway network, created as part of the industrial revolution for boats to carry freight across the country. Originally built up to 220 years ago, canals gradually became underused and derelict in the twentieth century. Through a popular volunteer led social

movement, the nation's canals have been restored and presently provide a functional historical infrastructure primarily used for leisure. The Canal name was frequently used by those actors whose primary interest was found to be boating and history.

Waterway, definition: "a narrow area of water, such as a river or canal, that ships or boats can sail along" (Cambridge University Press, 2016). This name can refer to an artificial canal, a natural river and anything in-between, as long as it provides navigable passage along water. It was the name most frequently observed in use by the greatest number of actors. Waterway was used almost exclusively by professional, commercial and civil actors involved in the project.

Waterway Park, has no definition as words in combination, however the word **Park** is defined as, "a large area of land with grass and trees, usually surrounded by fences or walls, and specially arranged so that people can walk in it for pleasure or children can play in it" (Cambridge University Press, 2016). As there is not any historical precedent for this name outside the case study a working definition adds the requirements of a Park to that of a Waterway. In that case a Waterway Park could be a navigable, narrow passage of water alongside which is a large area of grass and trees, specifically arranged for public leisure. This name was used almost exclusively by a small group of key actors who were interested in the wider social and environmental benefits of a future infrastructure, and less focused on the navigable water passage. These actors were also observed voicing opposition to the inapplicable use of the canal name regards the BMKW project.

My first observation of the Waterway Park name being used was at the Green infrastructure Consortium conference held at Cranfield University in March 2012. A senior officer from Bedford LA was presenting about his role in the project and used the Waterway Park name throughout the presentation. It provoked an emotional response in me, I thought 'who is this person renaming the project?' and 'that's not the right name'. I noted that the presentation emphasised the potential environmental and social benefits of the project more than just the standard blue infrastructure. After this event I realised that the project name was a contested issue and could form the focus of a significant part of my research. I started to pay more attention to when and

where the Waterway Park name was used and found a core group of actors who chose to use this name throughout the case study observations.

Later, I was able to question several of the actors using the Waterway Park name on why they chose to do so (see Section 5.6). They confirmed there was no collaborative agenda to use the Waterway Park name and could not agree on a definition. However they did confirm their shared priorities for the project in maximising its potential social and environmental benefits. They all highlighted the first time the name was used: the project's 2006 National Lottery funding bid (Halcrow & BMKWT, 2006) entitled the Milton Keynes Waterway Park (MKWP). The Waterway Park name was adopted to differentiate it from other waterway infrastructure and emphasise its wider public appeal. The MKWP work package included detailed designs for a large section of the proposed route, including the landscaping of integrated parkland alongside the waterway. This bid represented the project in the final selection process for Millennium funding. Although unsuccessful in winning full national lottery funding, the bid writing process was instrumental in providing the level of design detail necessary for the BMKW project to gain outline planning permission from Milton Keynes LA.

Design visions in the case study

In the BMKW project language was by actors as an everyday design tool. Specifically choices in the project name used were seen as support for different visions of a future infrastructure design. These design visions were created to promote different views of what the infrastructure project could be and how it could be used. In most projects communication of design visions would primarily rely upon visuals and illustrations. Due to the nature and stage of the BMKW project language was used to support favoured design visions.

There is precedent in the literature of design, and other related disciplines, for the use of design visions. Dunne and Rabby (2013) suggest that design can help imagine possible futures, using visions to create space for discussions about various alternatives that could be. These authors suggest by doing so we allow ourselves to forget what is now and explore other possibilities. In

Porritt's 'The World We Made' (2013) he uses the voice of a future author to describe an apocalyptic vision for a world ravaged by climate change. He then promotes scenario based design methodologies which enable us to imagine the future and inform present day design choices. In the realm of planning and urban design Van Dijk (2011) identifies the planning process as persuasive story telling that influences courses of action, focusing on the role of design in aiding communication and helping those involved with large scale urban design projects to better imagine future places. The work on Transition Design by Carnegie Mellon University (Irwin et al., 2015) identifies in their framework the importance of developing visions that can be used to support transitions. This growing body of literature points towards the use of visions enabling design practice in imagining a more sustainable future and in turn contributing to sustainable transition.

In this project different design visions were promoted by actor groups through the project names used. The three project names identified aligned with design visions of different futures, where the infrastructure created by the BMKW project achieves different goals and meets different aspirations. Creating a design vision starts in the verbal, choosing names and describing what they represent through discussion. Through observation of each naming group and what they prioritise in their discussions I articulate each associated design vision below. The Canal design vision looks back into history and wants to create in the image of the past industrial canal network. The Waterway design vision is concerned with creating a navigable water infrastructure that meets contemporary technical requirements and supports the current model of infrastructure use. The Waterway Park design vision looks to possible futures and the creation of something different to the present inland waterway structure, which combines green and blue infrastructure to bring a wider range of environmental and social benefits to a greater audience. Figure 4.16 attempts to diagrammatically communicate the relationship between different project names and design visions.

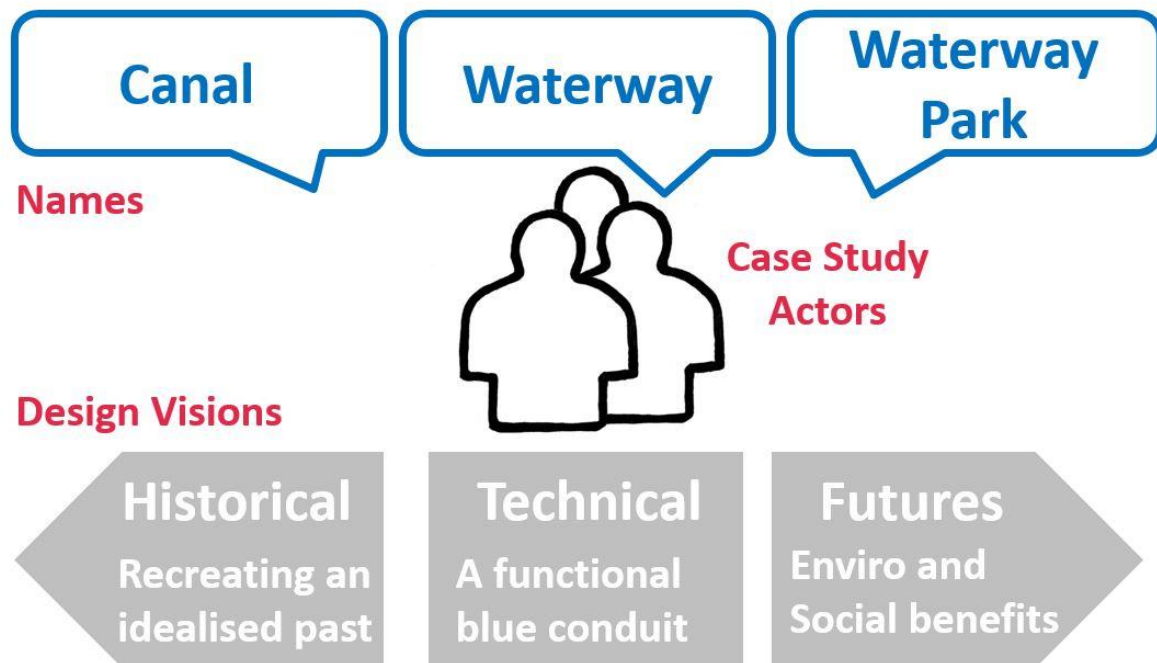


Fig. 4.16: Project names and their associated design visions.

In the same way that the project name was a contested issue, the associated design visions were competing with each other. In early 2014 the following assessment was made of their relationships. The Waterway design vision was dominant, being in support of the project management focus of professional activity. The Canal design vision was strongly represented by a core of volunteers, reflecting their interests as boaters and heritage supporters. The Waterway Park design vision was promoted by a small number of articulate actors who were influential in the project. The Waterway vision was dominant, with the Canal vision having continually challenged it throughout the project's history, while the Waterway Park Vision was growing in strength to challenge both. These competing design visions were vying for dominance in the BMKW project design discourse and had the potential to shape the design of future infrastructure based on how effectively they were communicated and the support they generated.

Sustainability Issues

Whilst growing in understanding of the BMKW project through my role as participant observer I did not press case study actors to discuss sustainability and future transitions, as I felt these would be difficult and controversial subjects. If I had done so, I may have unduly influenced the

case study and been seen to lecture other actors involved. Section 4.3.2, a very public project, has already described how environmental issues and water management were ignored and dismissed by many Trust volunteers. This situation was indicative of the predominant attitude among case study actors towards Sustainability related issues.

Trust documentation made aspirational statements that the waterway would be sustainable (BMKWT, 2013). However there was little evidence of a more than cursory understanding of the issue from nearly all Trust volunteers. When energy use was discussed, such as in relation to future operational water pumping needs, there was verbal agreement that this was something that needed to be minimised and could use renewable technologies, but this was not backed up by knowledge or technical work packages to identify the implications of these statements. These statements often used terminology related to sustainability, such as 'green', 'low carbon' and 'sustainable', but they were perceived as well intended buzz words. With regards to transition issues, when the future role of the inland waterway infrastructure was discussed within the Trust it was viewed as an extension of its current recreational use. The only other alternative offered was the possibility for the infrastructure to once again be used for freight transportation, revisiting its historical role as a canal.

Sustainability issues associated with the BMKW project were raised outside the formal Trust meetings with their limited number of attendees. At the 2013 Annual Partnership Conference a previous Trust director was in the audience and questioned why efforts had not been made to make sure the future waterway was low carbon, suggesting that this would be a critical part of delivering a 'Waterway for All', which was an established Trust slogan. He went on to suggest that the current focus of the projects activities would deliver a Canal and that would be a failure. This question was supported with one of the loudest applause of the evening. The predominantly public audience of this conference recognised the worth in addressing sustainability issues and in their applause also showing disapproval for the Canal vision.

A core group of actors in the case study promoted the need to address sustainability issues through the BMKW project. This actor group was also the group promoting the Waterway Park

design vision through the use of that project name. They supported the Waterway Park for the potential environmental and social benefits it could provide, without specifically aligning the benefits to sustainability. While the Economic aspect of Sustainability was well addressed in BMKW project activity (SQW Consulting, 2009) the Waterway Park design vision brought to the fore the Social and Environmental aspects. A Waterway Park addressed Environmental aspects through developing the accompanying green infrastructure around the expanded waterway 'towpath'. This blurring of the edges of the waterway into the surrounding landscape could benefit the local environment, such as by creating wetlands with increased biodiversity. The Social aspect was addressed through promoting the BMKW open up to a wider range of users than just those interested in the blue infrastructure, such as boaters and fishermen. A Waterway Park could more easily allow local communities to benefit from the project, for example, families could enjoy the green spaces and commuters could take advantage of the towpath. Of the competing design visions in the BMKW project it was the Waterway Park which provided a vision of a future where sustainability issues would be engaged and addressed.

Design Visions in Competition

The ongoing competition between the different design visions was witnessed through the ethnographic observations. In the case study this can be best exemplified in the discussions about the waterway towpath, and the differing demands placed upon this feature of the infrastructure in each design vision.

A case study actor who supported the Waterway Park described the design vision for the project as one with wider sections of waterway which included wetland habitat and soft edges. This design vision identified the access route alongside the waterway needed to accommodate walkers, cyclists and families as they enjoyed the surrounding environment or travelled to work. The classic hard edges of a towpath uniformly aligned to a canal edge were no longer needed and deemed to be a relic of historical technology from before the internal combustion engine. This was very much at odds with the competing Canal design vision and its goal of recreating the past.

The case for the Canal design vision was strengthened when a national horse drawn boating interest group expressed their concerns in correspondence directly to the Consortium chairperson. They demanded a towpath be provided on any new waterway as it had been on historical canals, to provide them necessary access and not restrict horse tow ropes. When this was raised as an agenda item at a Trust board meeting (TB4) the ensuing discussion included a heated debate about the two perspectives. Supporters of the Waterway Park design vision argued the inclusion of wide sections with ill-defined edges which blurring into marsh habitat, in which a 'towpath' might be built some distance away from the water channel. Other actors argued that the horse drawn boaters were a strong user interest group who would be best accommodated by including an uninterrupted towpath, and that ignoring or ostracising them at this stage would be a bad political move bringing much bad feeling with core inland waterways supporters. In the end written assurance was given to the horse drawn boating interest group that their point had come across and that it would be taken into account when the necessary level of detailed design work was conducted in future.

The above serves to illustrate a time when the Canal and Waterway Park design visions were in direct competition. The dominant Waterway design vision provided the default, neutral, functional response to meet a new standard requirement. This example of competition between design visions shows how the design of the BMKW is constantly being reconstructed through language and discussion.

The Waterway Park - Summary

The Trust lacks the abilities to convey design ideas through images, thus language is used as a design tool. Three names are widely used for the BMKW infrastructure project: Canal, Waterway & Waterway Park. Each name is used by different actor groups to tell stories about the project's future, creating distinct design visions within the case study. The Waterway design vision is currently dominant, with all the design visions competing against each other.

For most case study actors sustainability issues are not important or well understood. The actor group promoting the Waterway Park design vision do so because they believe it will offer wider environmental and social benefits. These benefits address sustainability issues and could offer the potential for the creation of a more sustainable infrastructure.

4.4 Ethnographic Research Summary

Throughout the longitudinal case study, ethnographic observations revealed an infrastructure project with a diverse set of actor groups involved. The infrastructure project's lifespan was very long, stretching back to a historical precedent 200 years ago and looks forward 35 years to a pragmatic completion date. A range of actor groups were identified, most importantly: the Trust, Consortium and Steering Groups. Several important objects have been created in the project, with the Community Boat forming the focus of many of the Trust efforts, and the A-Z Project Delivery Plan exerting power over design discourse. Many events were identified as of interest in the project and 36 events were attended and provided ethnographic data.

The Community Boat is representative of the Trust. It is a substantial task brought about by the significant efforts of motivated volunteers and skilful workforce management. It reflects an interest in boats and boating and is focused on the water based functionality of the infrastructure. While aiming to address the objective of community engagement, it falls short of engaging those outside its core area of support.

The proposed BMK Waterway is a unique proposition, with no national equivalent over the last century. While many other projects aim to renovate historical waterways, the BMK Waterway uses the history of its concept to legitimise it. Trust activities influence actors through overt efforts to engage with a general audience and hidden activities focused on key audiences. While the Trust director level volunteers ensure the latter is very effective, the impact of the former is patchy. The Trust is widely recognised for its achievements in progressing the BMK Waterway project and in turning the waterway into a credible and achievable project. However through the

case study the Trust's attitude and actions with regards to environmental, water management and construction issues fell short of the expectation of professional infrastructure actors.

Historical public participation and professional project management assistance have determined a preferred route and identified individual sections. Design activities undertaken prior to the case study have produced professional quality designs to the Trust's specifications. Currently the Trust's activities for delivering the waterway focus on lobbying to ensure it is included in each LA planning strategy along the proposed route, thus making it a material consideration in local planning decisions. This approach supports route side developments helping deliver the waterway through planning gain regulation. Focusing on planning gain transfers power over the design process from the Trust to the developers, with mixed results for the waterway. Results range from developers embracing and celebrating the waterway in their designs, to its being side-lined, compromised and even ignored. The Trust are left with influencing the waterway design by communicating the benefits and business case of the waterway to developers, along with using politics, persuasion and as a last resort legal action.

The Trust lack the abilities to convey design ideas through images, thus language is used as a design tool. Three names are widely used for the BMKW infrastructure project: Waterway, Canal & Waterway Park. Each name is used by different actor groups to tell stories about the project's future, creating distinct design visions within the case study. The Waterway design vision is currently dominant, with all the design visions competing against each other. For most case study actors sustainability issues are not discussed. The actor group promoting the Waterway Park design vision do so because they believe it will offer wider environmental and social benefits. These benefits can be seen as addressing sustainability issues and could offer the potential for the creation of a more sustainable infrastructure.

4.5 Ethnographic Research Findings

The following findings from the ethnographic data are most relevant for this research:

- A diverse range of actor groups were involved in the case study. These groups had different interests and agendas, and differing levels of power to influence the Waterway project. Whilst they worked together to get the infrastructure built, its design was contested.
- A range of objects were created within the case study. These objects both mediated the design discussions of case study actors, as in the case of the A-Z and Developers Guide, and shaped the perceptions of the project for actors external to the Trust and Consortium, e.g. the Trust exhibition display boards and Community Boat. The A-Z was the most powerful object in terms of influencing design discussions, being widely distributed, present at all meetings and used as definitive reference material.
- The present focus of BMKW project activity upon securing the route meant the majority discussions at formal meetings were focused on opportunities and barriers emerging along the routes, and identifying appropriate 'local' solutions.
- The Trust had identified goals to engage, involve and communicate with local communities. However their activities during the case study were found to mainly reach actors already interested in the inland waterways and boating.
- Many of the Trust actors had a limited understanding of the technical issues involved in building infrastructure to a professional level. This led to some of the proposals and ideas put forward by Trust actors creating tensions with professionals involved with the project.
- Many senior Trust actors had good networks of contacts across regional organisations. The Trust made use of these collective connections to help progress the project.
- The focus of activities undertaken to deliver the BMKW project have changed over time. Early activities aimed to garner project support through the public promotion of engaging

visions and opening up discussion. Activity eventually become more technical; in order to better support both project management and funding applications, which enabled more detailed infrastructure design work to be commissioned. Ongoing activities were focused on ensuring the continued viability of the chosen route and mutually beneficial arrangements with any route side land developments.

- Efforts to progress the BMKW project through planning gain policies associated with route side developments have introduced more actors into the design process. This led to developers having greater power over the design of the BMKW as it passed through their land.
- The influence of developers on the design of sections of the BMKW as it passed through their land has had mixed results. The best results for the BMKW came when the developer recognised benefits the infrastructure would provide to their development project.
- Design activity in the BMKW project was found to be mainly of two types. Firstly, dialogue based design activity conducted by Trust actors, focused on creating localised solutions to routing problems and on promoting different design visions for the project. Secondly, design activity conducted by professionals external to the Trust and Consortium (such as civil engineers, landscape designers and town planners), which generated 2D and 3D design outcomes in response to specific technical requirements.
- Three design visions for the BMKW project were evident in the case study: the Canal, the Waterway and the Waterway Park. These design visions were promoted by different actor groups through the names they chose for the future infrastructure in discussions and the stories they created about it.
- In general, Trust actors showed a limited understanding of sustainability issues in the BMKW project. A small group of Consortium and senior Trust actors had more knowledge of sustainability. This same group also supported the Waterway Park design vision,

specifically because they saw it as having the potential to deliver an infrastructure which addressed more sustainability issues.

Combining Ethnographic and Interview Findings

Both the findings from the ethnographic data and the findings from the interview data, detailed in section 5.7, inform an understanding of the BMKW case study. In order to develop the research interventions, the combined ethnographic and interview findings are analysed against the FT qualities in section 6.3 of the Interventions chapter.

5 Interviews

This chapter presents the empirical data collected from interviews. Details of the methods selected and used to collect and analyse interview data are given in the first five sections of this chapter. Findings generated from interview data and interpretations of these in light of the Fluid Transitions framework are presented in the last section of the chapter.

5.1 Data Collection

Interviews were chosen as one of the multiple methods of this study, in order to provide access to case study actors and both their deep knowledge of both the case study project and their individual areas of expertise. Due to the exploratory nature of the research questions, the semi-structured interview method was considered the most appropriate (Robson 2002). This format allowed the interviewee to be guided through selected topics, while also allowing other topics to emerge during interview 'conversations'.

A total of ten interviews were conducted between March 2013 and July 2013.

5.2 Interview Participants.

The identification of case study actors suitable for interviews took place over an extended period of time. In the thirteen months prior to the interviews the researcher attended a range of social gatherings, public events and open meetings, as part of the ethnographic research activity detailed in the last chapter. These activities enabled the researcher to get to know the diverse range of people involved with the project by participating in formal and informal discussions. At this early stage the researchers' position and future intentions were made clear to case study actors.

The engagement process with case study actors (and potential interviewees) was initially conducted by the researcher introducing himself at public events, talking about the BMKW project and his research interests, and then answering any questions they might have. As this process took place through repeated interactions at different times the case study actors started

to recognise both the researcher's face and his commitment to the project, which built a sense of trust and mutual understanding.

Making a choice about which case study actors to interview was based on an understanding of what they could contribute to the research and their availability. The potential for an actor to provide useful information for the research was assessed based on their voluntary and professional activities undertaken in relation to the waterway project. Examples of such activities included: authoring a funding bid, leading historical public consultations, supporting the project as a civil servant, making decisions as a BMKW Trust director, and representing the interests of a waterway route land owner.

One of the first interviews was with the BMKW Trust Chairperson. Once this actor had completed an interview, and provided consent on behalf of the Trust for its participation in the research, other BMKW Trust actors agreed to be interviewed. These senior BMKW Trust volunteers were able to recommend other case study actors suitable for interviewing, snowballing the potential scope of interviews (Robson 2002; Bijker, 1995). This was particularly useful in gaining access to actors outside the core project study groups of the BMKW Trust and Consortium. These actors weren't necessarily supportive of the proposed waterway and were more difficult to engage with, as is evidenced by there being eventually only three interviewees in this category.

The interview participants are listed in table 5.1 in the order they were interviewed. The table identifies their pseudonym, the organisation they represent and their position within it, and an indication of their background areas of expertise and experience. 'Actor type' identifies their relationship to the BMKW project: a member of the organisations pushing to make the project happen; someone who is collaborating closely with the project and representing actor groups responsible for delivering the future waterway; or from an actor group that is a required partner in the future waterway and potentially representing variable levels of support for it. Participants are broadly split into two groups based on their level of involvement. Group 1 are heavily involved in the BMKW project and highly supportive. Group 2 sit at a distance from the project, offering a

different viewpoint, with varying levels of support. How these groupings affected the interview questions is discussed in section 5.4.

Table 5.1: Interview participants.

Participant	Organisation	Position	Background	Actor Type	Group
<i>Marion</i>	BMKW Trust	Senior Trust volunteer	Ex- LA Transport.	Project insider	1
<i>Cecil</i>	Canal & River Trust (CRT)	Senior manager & technical expert	Town planning & Architecture	Project collaborator	1
<i>Barry</i>	BMKW Trust	Senior Trust volunteer	Regional Development QUANGO, Project management.	Project insider	1
<i>Zack</i>	BMKW Trust	Senior Trust volunteer	Senior business manager	Project insider	1
<i>Timothy</i>	BMKW Trust & CRT	Senior Trust volunteer & CRT Director	Ex-LA, Architecture knowledge.	Project insider	1
<i>Joe</i>	Bedford LA & BMKW Consortium	Senior civil servant & consortium secretary	Economic development	Project collaborator	1
<i>Chris</i>	Marston Vale Trust	Senior Trust Manager	Environmentalism.	Supportive project partner	2
<i>Katie</i>	O&H Properties, Developers	Senior development manager	Town Planning	Neutral project partner	2
<i>Mike</i>	Internal Drainage Board	Senior Engineer	Water Management	Resistant project partner	2
<i>Saffron</i>	Central Beds. LA	Civil servant	Environment & Green Infrastructure	Project collaborator	2

5.2.1 Interviewee Profile

The following profiles provide a summary of the range of subjects covered, and the positions taken, by each participant in the interviews, to add contextual detail to that in table 5.1. They include observations about interviewees' organisational affiliations, activities, areas of interest and knowledge.

Marion: Presented a detailed narrative of the proposed waterway's historical context and its contemporary history, which she constructed from volunteer work as a Trust director and previous professional experience as a regional civil servant involved in the project. She was able to describe in detail how technical routing challenges were being overcome and identify the network of actor groups key to project progress.

Cecil: Provided an in-depth narrative of his involvement in the early BMKW public engagement process, which had helped to inform waterway route choices through the participation of local communities and land owners. He had been involved in the promotion of the BMKW project which had generated a broad level of support for it. His account was in-depth, due to his long involvement with the project, and well informed by his personal background in urban design, planning, restoration and enterprise management.

Barry: Presented a very practical assessment of the position of the project and the challenges it faces. Having previously worked in project management on large scale infrastructure projects he was knowledgeable about projects with similarities to the BMKW. His position combined an understanding of the technical requirements of infrastructure builds with an appreciation of the political necessities for their delivery.

Zack: Presented a very progressive view of the waterway project, focusing on the Trust and its activities rather than the waterway route and its technical challenges. He was concerned with the Trust successfully communicating its message and that the local communities around the waterway route were engaged with, supportive of, and participated in the waterways creation.

Timothy: Presented a knowledgeable perspective on big civil engineering projects, having worked as a senior civil servant in the Milton Keynes LA, and having professional expertise in planning. He presented a narrative of the BMKW project history where support had developed from a public grassroots level, had influenced local politics and been enabled through the efforts of Trust volunteers. He was involved with the lottery funding application for the Milton Keynes route and provided detailed information. He was highly supportive of the project and gave eloquent descriptions.

Joe: As a senior council officer he held a position of responsibility within the Consortium, so was influential in the BMKW project. He was highly supportive of the project and which he justified on the basis of public support which gave him a stronger political mandate. He was a keen supporter of the Waterway Park design vision and promoted the vision on public platforms given opportunity.

Chris: Presented a nuanced position, reflecting upon the project from a position of professional knowledge about land management. Chris worked within the Steering Groups helping to deliver the project, but was also critical of the direction that BMKW was taking. He was a key promoter of the Waterway Park design vision and was able to articulate the strategies he thought should be adopted and the benefits that vision would offer.

Katie: Presented the position of the land developer she worked for who owned similar development land (mostly brown field with water bodies) and had learnt lessons from these as they were developed. She described how the developer had studied other international housing developments which had integrated with water and displayed very good technical knowledge of the development process. She presented a business orientated perspective on the project and was not afraid to be critical of the BMKW project.

Mike: Represented the Internal Drainage Board (IDB) position, an organisation responsible for managing water levels, flood risk and watercourses within designated districts. His discussion focused on the technical and legal issues of avoiding risk in water management. He took a long

term view, being mindful of the responsibility of managing a manmade system that had been created gradually over many hundreds of years. He presented a critical professional position on the BMKW project.

Saffron: A council officer responsible for green infrastructure, she represented the Central Bedfordshire LA position on the waterway. She had been involved in supporting the project through several challenging situations involving waterside land development. She was a supporter of the Waterway Park design vision, which she recognised as highly beneficial for green infrastructure along the waterway route.

5.3 Interview Method

In an effort to make participation as easy and convenient as possible a choice of venue was offered the interviewee. The researcher offered to travel to an interview venue of the interviewee's choice, requesting only that a private, quiet space be available to facilitate an uninterrupted conversation and a successful audio recording. A meeting room at the Open University Milton Keynes campus was offered as an alternative.

Specific interviews took place at the following venues: Cecil in a meeting room at the Canal and River Trust (CRT) main office in Milton Keynes; Zack at a home office in Cambridge; Joe in a meeting room at Bedford LA Borough Hall in Bedford; Chris in a conference room at Marston Forest Centre; and Mike at a meeting room in the Internal Drainage Board offices, Bedford. All other interviews were conducted at the Open University's Milton Keynes campus.

All interviews followed, as far as possible, an established format. The interviewee was thanked for giving their time and agreeing to undertake the interview. The researcher explained that the interview would be a series of questions intended to promote an interesting conversation that should take about an hour. The participant was asked to confirm they had read the information sheet and participant consent form (see Appendix A) previously supplied to them. They were given time to ask any questions about the research or interview process. All participants supplied a signed consent form voluntarily and all agreed to the interview being audio recorded. A digital

audio recorder was placed in a central, visible position, set to record and then the interview commenced.

A guide was created for each interview and a hard copy of this was used by the researcher as both script and reference point. An interview guide is provided in Appendix D. The guide contained a list of questions for that interview, along with a chronological check list of interview activities and notes on the participant. Blank areas were provided in the guide for the researcher to make hand written notes during the interview. Along with the audio recordings these guides were the primary empirical data generated from each interview.

5.4 Interview Questions

Consistent with the semi-structured interview method, the purpose of the questions is to stimulate and allow a conversation between the participant and researcher (Robson, 2002). The questions frame the conversation in a consistent manner, enabling the researcher to generate relevant empirical data.

The interview questions focus the dialogue onto topics and areas of interest identified in the literature review, such as design activity and public participation, and were further informed by insights gained from the initial ethnographic stages of the research.

As the interview participants were in two clearly defined groups it was possible to use one set of questions for all the Group 1 interviewees and then modify these questions to suit the more varied interviewees of Group 2. The following sections provide detailed explanations of the core questions used for Group 1 which are followed by an explanation of how these core questions were modified for use in the Group 2 interviews.

Core Questions for Group 1 Participants

These questions were arranged in an order which would lead the dialogue from one topic to another.

The following list of seven questions was used for the six participants in Group 1 (see table 5.1). Each question is described using the same format. The core question is presented in bold, including the necessary speech scripted to introduce and contextualise the question. Any sub-questions are then presented in italics. These were used to guide the conversation onto any aspect of the core question which had not yet been discussed. Subsequent paragraphs detail the theoretical and practical reasoning behind the question's construction and focus.

Question 1:

So how did you get involved with the Bedford & Milton Keynes Waterway?

This question allows the interviewee to introduce themselves and their relationship with the waterway project. Interviewees often have certain things they feel are necessary to say at the start of a conversation in order to represent themselves and establish their credibility (Robson, 2002). This starter question allows the interviewee enough space to talk about themselves, while maintaining a focus on the case study. Other core questions and their sub questions were then asked in the following order.

Question 2:

A current plan for the waterway exists, as represented in the 'A-Z guide', and this plan has changed over time. How has this plan come into being?

Sub questions: Who has been involved in designing the waterway?

How have these designs been communicated?... to experts and to public (visuals, maps, illustrations, models)?

This question seeks to stimulate discussion of the design within the context of the waterway project; what is seen as design, who does it and how does it physically manifest itself?

The question initially refers to the waterway 'plan' rather than 'design'. Ethnographic observations had identified a focus on project management, and plan was thought to better fit that discourse. Design is introduced in the sub-questions, explicitly asking the interviewee to

discuss design, to identify the actors/actor groups who have engaged in the act of designing, what designs have been created and how they have become physically manifested. This line of questioning intends to build an understanding of both what the interviewee understands design to be and to detail the current and historical design activity within the context of the case study.

The 'A-Z guide' referenced in the initial question is the 'A-Z Project Delivery Plan' published annually by the BMKW Trust and Consortium (BMKWC, 2012), and described in more detail in section 4.3.3. This document was identified in observational data as being an important artefact which influences design discourse. As such, its use within the question allows easy reference to the current collection of endorsed designs and plans.

Question 3:

It is acknowledged that the waterway will take a long time to complete, with a pragmatic estimation of around 20 years to completion. How do you think the present design of the B&MK waterway will stand up over time?

Sub question: Do you think our use of waterways might change into the future?

This research is concerned with the concept of transition and the associated necessary large scale change over time. Consequently question 3 asks the interviewee to consider the waterway at different points of time through its future lifecycle, and how its context and use might change.

Progressing the waterway project and its completion are a constant focus of discussions in the Trust. The start of this question refers to the future point in time when the waterway is completed, suggesting how far in the future that might be, something which all actors have discussed and have an opinion on. The questions then challenge the interviewees to consider how they think potential changes in the future could impact upon both the waterway design as it is presented now and upon waterway infrastructure as a whole. This brings into consideration the influences of human actors, the direct impacts of socio-technical change, and the in-direct impacts of environmental change.

Question 4:

One of the tag lines for the waterway is 'A Waterway for All'. What does that mean to you?

Sub question: What do you understand as the meaning of sustainability?

Do you think the proposed waterway is sustainable?

In attempting to understand how transitions to sustainability can be influenced it was necessary to gain an understanding of how the case study actors understood the issue of sustainability, and how they related this to the waterway infrastructure.

The introduction frames the question around one of the marketing tag-lines used by the BMKW Trust to promote the waterway: 'A Waterway for All'. Ethnographic observations suggested that where this tag-line was discussed it was clearly aligned with some aspects of sustainability. Getting the interviewee to initially explain what this project tag-line meant was a good way to get them to broach the sustainability issue, so even if they had negative attitudes to sustainability they would start to recognise the issue as relevant to the waterway project.

The follow on questions allow the researcher to explicitly focus on sustainability, assessing the interviewee's level of understanding of the term, what issues they relate to it and how they relate sustainability to the waterway project.

Question 5:

The proposed waterway is a complicated and expensive thing to create. Why should we do it?

Sub questions: What problems do you foresee with the proposed waterway?

Can you see solutions to these problems?

This question investigates the social construction of the waterway. It asks the interviewee to focus on the benefits and problems associated with the infrastructure. This approach follows the techniques detailed by Bijker (1995) where focusing on benefits and problems should encourage answers that provide an understanding of their level of support for infrastructure.

The use of 'we' in the main question reflects the position of the researcher in the case study as a participant observer, member of the BMKW Trust and also underlines that this question was specific to Group 1 interviewees.

Question 6:

The preferred route chosen for the waterway passes very close to several communities. How have the people who live near this route been engaged with regards the waterway?

Sub questions: How has support for the waterway been generated within the wider public?

Since participation is one of the principle concerns of the Fluid Transitions approach it is necessary to gain a better understanding of how this is manifested in the case study. Arnstein's (1969) ladder of participation prioritises participation of citizens from outside the project's professional actors. The question aims to assess what has been done to engage with the public/local communities and promote their participation.

Question 7:

Given all that we have talked about who do you think are the people or groups important to the development of the waterway? (supportive and or unsupportive)

Sub questions: Who else should I interview in order to gain a complete picture?

Can you recommend a personal contact?

This question aims to utilise the technique of snowballing (Bijker 1995; Robson, 2002) to identify actors within the case study who could be relevant to the research. Building upon the understanding of the case study of the interviewees is a good way to quickly build up a picture of the range of actor groups involved in the case study, how they relate to each other and the overall power dynamics. This information must be regarded in consideration of the source and any limits or bias they might have.

The researcher was aware that gaining access to some actors might be difficult, due to their selective engagement policies, zealous gatekeepers or time poor schedules. Gaining specific

contact details for a relevant individual in an organisation, or even better an introduction through the interviewee, would benefit the progress of the research.

Development of Interview questions for Group 2 Participants

The choice and the focus of questions were modified on an individual basis for each of the interview participants in Group 2. The core questions described above were changed to take account of the participant's jobs, their organisational affiliations, any specialist areas of knowledge and their different relationship to the waterway project. Group 2 participants work for organisations which have authority over particular sections of land, either through land ownership or in a caretaker, governmental or statutory role. Questions were therefore modified to focus on the impact of the waterway being routed through the land that their organisation was responsible for, and how that arrangement worked with their organisation's plans for the future.

Changes made to interview questions for Group 2 also involved the removal of any phrasing which assumed that interviewees supported the waterway. Questions about sustainability knowledge and the impacts of envisioned future changes were made more explicit. As the research progressed, and most interviews had been completed, new areas of interest emerged that were relevant to the case study research. New questions were introduced to encourage participants to address these areas and thus allow the research to be informed by their expert area of knowledge.

5.5 Interview Data Analysis

The interview data analysis was an iterative process that combined multiple methods of analysis, applied at different stages of the research process. The interview audio recordings were transcribed, coded and then analysed a variety of methods.

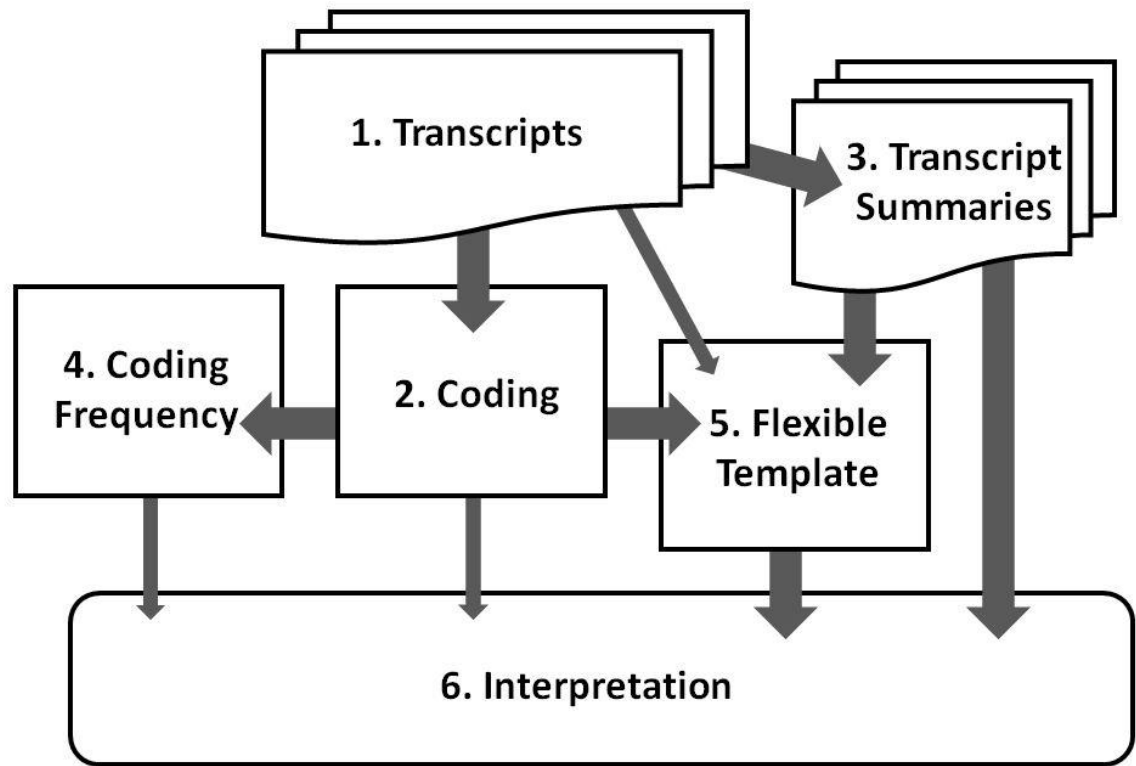


Fig. 5.1: Data analysis process and information flows.

The process of analysis of the interview data used the following methods in the order listed and shown in figure 5.1:

1. Transcripts generated
2. Coding process applied
3. Transcript summaries generated
4. Coding frequency plotted
5. Flexible Template generated and applied
6. Interpretation of data analysis conducted

As the interviews were analysed these methods sometimes overlapped and were conducted in parallel. The following sections details the interview data analysis process in the order in which they were initially begun.

5.5.1 Transcription.

Transcripts of the interviews were created by the researcher using software to control the audio playback of the interview.

Included in the transcript data were pertinent external factors to the dialogue (e.g. phone ringing) that may have had an influence on the conversation. These additional elements also helped remind the researcher of the interview experience during the data analysis process.

An example of a transcript follows.

[Transcript excerpt begins]

AR: I was wondering how you have been involved with the B&MKW?

Chris: Well we, and I mean the Marston Vale Trust the charity which was set up to lead on creating the Forest of Marston Vale. The Trust has been involved in progressing the waterway for probably around a decade on and off. We are a member of the consortium. My Chief Executive sits on the consortium representing us, and I sit on the steering group dealing with more implementation related matters for the Bedford and Marston section, basically the Bedfordshire and Central Bedfordshire sections of the waterway alignment. The reason we are involved is because the waterway is a very significant and expensive project but it is wholly compatible with the Forest Plan which was the strategy setting out the governments vision for regenerating this area between Bedford and Milton Keynes principally through using the environment in an somewhat exploitative way to transform perceptions of the area, to regenerate a degraded landscape, transform perceptions, to stimulate economic and social regeneration. So environmental regeneration being used to precipitate and facilitate economic and social regeneration. And the waterway is very much a natural fit with all of that because economically it is predominantly a leisure and recreation [outturn?] although there would be some potential for commercial and industrial use of it. Environmentally if the design is right and it delivers on the environmental regeneration objectives socially it provides a huge recreational spine through the core of the vale. So it sits very neatly at the bottom of the valley with us planting trees everywhere we can all the way around it, so almost perfect synergy.

AR: Excellent.

Chris: I've probably answered half a dozen questions all out of order.

AR: That's the way it usually goes. [both laugh] So obviously you have been quite involved. There is a current plan for a waterway and that's commonly represented in the A-Z guide. Is that something you're aware of?

Chris: Indeed.

AR: I'm interested in how you understanding that plan has been created?

Chris: I think we have to credit *Ted Green* in doing a phenomenal job when he was seconded from DCLG to move the whole project forward. Because what *Ted* managed to do, from our perspective as sort of supportive observers of the project itself, what we saw *Ted* do was turn a nice idea promoted by very enthusiastic amateurs (without wishing to be unkind to anyone involved) but it converted that into a credible vision and project which seemed feasible, probably for the first time, and was handled in a highly professional and competent way. So it put it on a professional footing from our perspective, which was a complete game changer, and as part of that *Teds* approach was to break it down into bite size chunks. As with any project you break it down into its constituent parts and he did that literally in a geographic context or sense, section by section. What are the issues? What are the challenges? Who are the partners? And I think that has been the cornerstone of their success ever since.

[Transcript excerpt ends]

Notable aspects of the interview that were not the spoken word were recorded by placing between square brackets. For example in the 5th paragraph above the participants are noted to be laughing. Recording the interview 'as spoken' produced long tracts of transcript text that didn't have the punctuation expected of the written word. However, punctuation was included in the text to represent the cadence of speech and perceived intention of the speaker in the written format. For example the 5th sentence of the 2nd paragraph above is very long, but has many commas and a pair of brackets to better communicate its perceived intentions.

Transcribing the interviews developed familiarity with the data. Notes were taken during the transcription process and these fed into the analysis of the data.

5.5.2 Data Analysis Techniques

The following sections provide an overview of the data analysis techniques used. Firstly a number of iterations of coding were employed to identify key themes, and these iterations are described below. Insights and quotes were captured in the form of Transcript Summaries. A Flexible Theme Template approach was then adopted, which drew from the transcript summaries to produce the final themes. These data analysis techniques are described below in the order in which they were initially employed.

5.5.3 Coding.

The initial coding process adopted for the transcripts combined Theme and Template analysis, as described in the Methods chapter. In this coding process the theme analysis aligns the coding to regular themes identified in the data. The template analysis uses the four elements of the Fluid Transitions as the template and identifies their occurrence in the transcript. Their use was complimentary to one another.

A choice had to be made as to whether it was appropriate to use a software package to assist with data analysis. NVivo software was available through the university license and an assessment was made of this package by reading reviews, talking to existing users and trialling the software on discrete sections of interview transcripts. It appeared to provide obvious benefit to the management of data, through various tools for labelling, identifying, comparing and manipulation. However, given the small scale of the data a decision was made to manually analyse the interview transcripts, using pens and working through a 'paper-based' coding process - more akin to my experiences working as a designer.

The coding process involved working through the interview manuscripts to generate theme and template codes. These codes were kept to one or two words in order to avoid becoming too complex and overwhelming. After this coding process was carried out on two transcripts an initial

Primary Codes Secondary

Activity Infrastructure Env. Barrier u

Before Drains. Water / flooding Risk technical

Intro Water / attenuate

Aspect Space Env. Technical Regional watercourse water / storage.

Naming Env. Env. Time Aspect Env. Barrier Space

Infrastructure Barrier Usage User conflict.

Env. Environment Barrier Time. Water Management Risk

Activity Design Infrastructure Barrier Env. Space u Trust. Usage user conflict. Water local watercourse.

Interview - Mike - 22nd July 2013

navigation/public open space, but we do have a policing role for land drainage and flood risk management. So it's critical that anything they do is appropriately developed such that they don't go too far down a blind alley of developing something which could increase flood risk, which we would object too and wouldn't issue a consent form. We are a key partner because at the Milton Keynes end it's down our Brook through our district. On Broughton Brook, when you come over Broughton Brook, Bedford district starts around Broughton Lake, so Stewartby Lake we operate as a flood storage reservoir, so that is a 88 hectare flood storage reservoir, an old clay pit, which we operate for, attenuating flow to slow up run off through the catchment through Bedford. So over 88 hectares every 40 mm of increase in water level from rain is 25 000 cubic metres, so it's under the Reservoir Act. I think it goes up 1.5 metres typically in a winter. So the line on the Bedford side generally comes down the [Elmstow] Brook route through Stewartby Reservoir and along that [Elmstow] Brook corridor which is watercourse we operate and manage, so that makes us a key partner in terms of policing what they do, obviously from an engineering background, but we don't have any navigation function so we are not actually listed as one of the members of the group because obviously we haven't got that function.

AR: Pretty closely linked though. If you talk about a waterway then managing water is close to that.

Mike: It is yeah. I suppose in simple terms though, a waterway, it's all a conduit of water. So in simple terms when I am talking about a reservoir I'm thinking of a flood attenuation/flood storage reservoir which is generally empty, it fills up when it rains heavily, and then is drained down in ideally 1-4 days after the rainfall event, so if we have another rainfall event it's empty and can fill up again, and slowly realise it, so that downstream we aim to manage the flow in the channels, because obviously if you don't have a flood storage reservoir all that water is just going down the catchment and you have got flooding on the flood plain every time it rains. When a navigation authority talks about a reservoir they are generally thinking of having a reservoir full at the top of a pound area so they can draw off water for lock movements. So where we both talk about water reservoirs they want there's full and are concerned if the water level starts dropping, we want ours empty and are concerned when it goes up and want it to be empty as soon as possible. [13-18]

AR: Different kind of parameters. You are driven by the unpredictability of nature where as they have a function they want to maintain.

Mike: Well again it's unpredictability of nature because if we have a dry summer they will see their water levels coming down and they might have navigation restrictions. Obviously with a wet summer like last year we are thinking well our flood storage reservoir is full and we need to get it emptied as soon as we can, so when it rains again next week or next month we have the capacity to store water. So it's all driven by nature and the unpredictability of nature, but from different from different perspectives and ends of the spectrum. We have all got our challenges but where the conflict arrived was about 4 years ago, at the Milton Keynes end, they were proposing quite a big water storage reservoir.

AR: The local authorities were?

Mike: No the waterways group were, for navigation, over at the Broughton Brook, and 'A' it was primary building land, but again it's a question of how will that work because you can't use that to

Summary

How the BRKKN works with IDB areas + watercourse.

How the BRKKN works + conflict with waterway requirements from reservoir.

How the BRKKN works + conflict with waterway requirements from reservoir.

How Trust and IDB requirements have conflicted

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This process produced physical artefacts which were critical to the data analysis. Transcripts were printed out onto A3 paper and these hard copies were annotated to record emerging codes and themes (see example in figure 5.2). The left margin was used to record codes identified in the interview text (e.g. Environment>Water). The right margin was used to summarise the main points being made by the interviewee. The transcript text itself was marked up to identify important or relevant quotes. All these separate notation marks were made in different colour inks, in order to make identification easier and generate connections across different transcripts.

Alongside the annotated transcripts, the codes were collated into a digital Excel spreadsheet. This document grew as more transcripts were analysed. The full list of these codes is reproduced in table 5.2.

Table 5.2: Initial set of Codes generated from analysis of interviews.

Theme - Codes											
1 lvl	2 lvl	3 lvl	1 lvl	2 lvl		1 lvl	2 lvl		1 lvl	2 lvl	
Design			Aspect			Activity			Actors		
	visuals			energy			development			local communities	
	" map			resources			volunteer			community boat	
	" 3D			green house gases			renovation			trust	
	" c/section			legal			collaboration			funders	
	" line&level			technical			recreation			caretaker groups	
	technical			size			transportation			engineers	
	requirements			responsibility			promotion			local authorities	
	vision			change			discussion			knowledge	
	landscape			balance			connecting			government	
	options						safeguard			legislation	
	multiple uses			Economic			research			policy	
	innovation			funding			maintain			land owners	
Environmental				charges			enforce			consortium	
	water			eco system services			modelling			politicians	
	" flooding			development			working			future users	
	" attenuation			cost effective			tourism			boaters	
	" storage			Time			Benefits			current users	
	management			completion			national			public	
	woodland			near future			economic			businesses	
	open space			post-waterway			regional			media	
	protected species			historical			local			steering group	
	water framework directive			lifespan			common good			Planning	
	enviro. impact assessment			present			well being			policy	
Infrastructure				immediate			green space			scope of role	
	usage			Objects			public support			process	
	" recreation			A-Z delivery plan			joy			Template - Codes	
	" transit			community boat			visual			Participation	
	" freight			developers guide			realistic			construction	
	" utilities			economic impact assessment			regeneration			public	
	historical			civil engineering studies						focus	
	construction			planning documents			Barriers			required	
	maintenance			Societal			cost			missing	
	towpath			support			land constraints			formal	
	green			benefits			project size			engagement	
	incomplete			inclusivity			negative perceptions			Flexibility	
	lifespan			needs			funding			to future	
	network			diversity			technical			waterway route	
	operation			Space			project credibility			Pragmatism	
	drains			local			risk			opportunistic	
Naming				regional			prioritisation			focus efforts	
	waterway park			national			user conflict			Situatedness	
	canal			rural			user numbers				
	green corridor			urban			access				
	waterway for All			topography			physical				
	wet ditch			housing			legislation				
	conduit of water			ownership			fear				
	blue and green			waterway route							
				river							
				watercourse							
				identity							

Coding frequency

To assist the analysis of coded data, the frequency of code occurrences was analysed (Robson, 2002). Logging the occurrence of each code in each transcript produced a coding frequency chart. A tally system was used to represent numerical frequency, as this would give a visual indication and help comparisons overall. Part of the transcript coding frequency chart is shown in table 5.3, focusing on a sample group of codes. The frequency chart was produced after five interview transcripts had been coded.

Coding data analysis assessment

A number of problems arose with the coding process that led to some reflections and revisions to the analysis of the transcripts. The annotated transcripts repeatedly showed clusters of similar codes, such as: >Actors>Land owners & >Activity>Development & >Design>Technical. This method of coding provided a very fine level of analysis to the data, which was difficult to make sense of. On reflection, this approach to coding became too abstract, proving problematic to connect and identify relevant concepts. This hindered the researcher in developing meaningful themes necessary to progress the analysis process further.

The coding frequency chart provided an overview of the topics and issues an interviewee had focused on. For example table 5.3 shows that while >Environmental>Water was discussed by all interviewees. Mike focused on this code much more, which was expected for the IDB water engineer. However the frequency chart also gave unexpected results, highlighting codes that had an unexpectedly high occurrence for certain interviewees. For example Mike also discussed >Environmental>Protected Species the most, whilst Saffron, an Environmentalist, had no occurrences of this code. This method of coding the data analysis progressed the researcher's thinking little at this point, it would only be later, in combination with the Flexible Template that the frequency chart would contribute to the data analysis understanding as a whole.

This approach to the coding process became progressively slower and after coding the first five interviews, relatively few new codes were being created. Taking stock of progress a decision was

made to discontinue this data analysis approach at five transcripts and adopt a second approach to coding.

The transcription and analysis process thus far had allowed the researcher to develop a deep understanding of the interview data. This helped inform the identification and adoption of the Flexible Template approach, described below in section 5.5.5

Table 5.3: Transcript Coding frequency chart.

Codes			Transcript Coding Frequency				
1 lvl	2 lvl	3 lvl	Joe	Cecil	Mike	Katie	Saffron
Design							
	visuals		I				
	" map					I	
	" 3D						
	" c/section						
	" line&level						
	technical requirements		II	IIII	IIII	III	IIII
	vision		IIII	IIIIIIII	III	IIII	IIII
	landscape		I			II	I
	options		I	IIII	III	III	
	multiple uses			IIII	III		
	innovation			II			
Environmental							
	water		III	I			IIII
	" flooding		III	IIII	IIIIIIII	III	III
	" attenuation				IIIIIIII		
	" storage				IIII		
	management		I	IIII	III	III	III
	woodland		I			I	
	open space		I	I		I	IIII
	protected species			I	III		
	water framework directive				II		
	enviro. impact assessment					I	I
Infrastructure							
	usage			IIII	IIII	I	I
	" recreation		III	IIII	III		
	" transit		III	IIII		I	
	" freight		I	III	III		
	" utilities		I	III			
	historical			III	II		III
	construction			IIIIIIII	IIII	IIIIIIII	I
	maintenance			I			I
	towpath			III		II	II
	green		I	I			IIII
	incomplete		III	IIII	II		I
	lifespan		I				
	network			III			
	operation			II	III		
	drains				IIII	I	
Naming							
	waterway park		I				
	canal		IIII	III	III	I	II
	green corridor		III	I		I	
	waterway for All						II
	wet ditch		II	I			
	conduit of water				I		
	blue and green					I	

5.5.4 Transcript Summaries

The analysis of interview transcripts through the coding processes described above provided the researcher with a deeper familiarity and understanding of the data the transcripts. Transcript Summaries were created to capture this information at the time of initial analysis and would provide a guide to the data when the researcher subsequently revisited the transcripts at later stages of the analysis.

The Transcript Summaries were created immediately after the completion of the transcript analysis. The annotated transcripts identified and captured quotes, summary statements and observations about the focus of the conversation. The summary statements and observations from across the transcript were assessed and where possible combined and amalgamated to provide concise summary points. Quotes were lifted from the transcript text and attached to the relevant summary points in order to provide context. The following is an excerpt from the Transcript Summary for the interview with Chris:

[Transcript Summary excerpt starts]

- Chris is an articulate knowledgeable environmentalist with good understanding of local geographical and political situation.
- The Marston Vale Trust (MVT) is a charitable organisation aiming to regenerate the Marston Vale (MV) through creation of a forest there.
- Chris and the MVT have to remain objective and relatively neutral about local developments, but as the BMKW offers synergies with the MVT's objectives they are in favour, supportive and helpful to the project.
 - *"The reason we are involved is because the waterway is a very significant and expensive project but it is wholly compatible with the Forest Plan which was the strategy setting out the governments vision for regenerating this area between Bedford and Milton Keynes principally through using the environment in an somewhat exploitative way to transform perceptions of the area, to regenerate a*

degraded landscape, transform perceptions, to stimulate economic and social regeneration.”, Q1P1

- MVT has worked with the BMKWT over its history and has seen it become more professional and credible over time.
- The BMKW project gained credibility with local authorities and expert groups with the secondment of Andy, a senior civil servant from DCLG, as full time project officer in 2005. He understood the professional requirements of a strategic infrastructure project, conducting the first proper engagement with route land owners and aided project management and deliverability through the identification of the A-Z route sections based on identified issues.
 - *“...Andy came on-board and had the difficult conversations with the key land owners around the area, and said ‘Ok, well this is what we would like to do. How could it work for you? What can you get out of it? How can the waterway help your objectives and aspirations?’, and those sort of conversations that no one had had before. So a very significant turning point in the prospects of the project.”, Q1P2*

- BMKWT volunteers have often shown an amateurish approach and lack of professional knowledge regards the creation of a major strategic infrastructure, especially regards the use of MVT land and conducting volunteer digs of waterway sections.
 - *“[BMKWT attitude to the use of MVT lands] a useful indicator of the distinction between the rather simplistic and enthusiastic but slightly amateurish perspective/attitude to the waterway which we saw a lot of historically, which has helped get it where it is, compared to the professional, knowledgeable attitude that Andy brought and changed the fortune and prospects of the project entirely.”, Q1P5*

[Transcript Summary excerpt ends]

By the time the Transcript Summaries were underway the interviews had been completed, ethnographic observations had been under way for over half a year and several interviews had undergone the transcription process. In conducting all these different research activities in parallel the researcher had by now developed a deep understanding of the case study and observations and findings were now being identified. This developing knowledge and emerging insight into the research formed the basis for the selection of elements to be included in the transcript summaries.

The Transcript Summaries were used as first points of access into the interview data. The researcher would then go back to the annotated transcript and drill down into that document to help clarify or contextualise a particular summary point made in the transcript summary. The summaries thereby provided a very helpful aid for the researcher when revisiting transcript analysis, supported the interpretation process by succinctly capturing pertinent information, and informed the design and implementation of the flexible template approach.

5.5.5 Flexible Template approach.

The interview data analysis process had reached a point where it was necessary to take stock, reassess and adapt. Qualitative data analysis is an iterative process, through which data is organised, reorganised and distilled into codes. From those codes themes identified through the process of analysis. However, the coding analysis employed in this instance had failed to allow the researcher to move through the analysis process to identify meaningful themes. Accepting that qualitative data analysis needs to be a fluid process and may require a flexible engagement strategy with which to analyse different data sets, a new approach was identified. The data analysis process flowchart is reproduced in figure 5.3 below, with the Flexible Template process highlighted. This represents the stage when the data analysis process shifted to the flexible template and how the information flows changed.

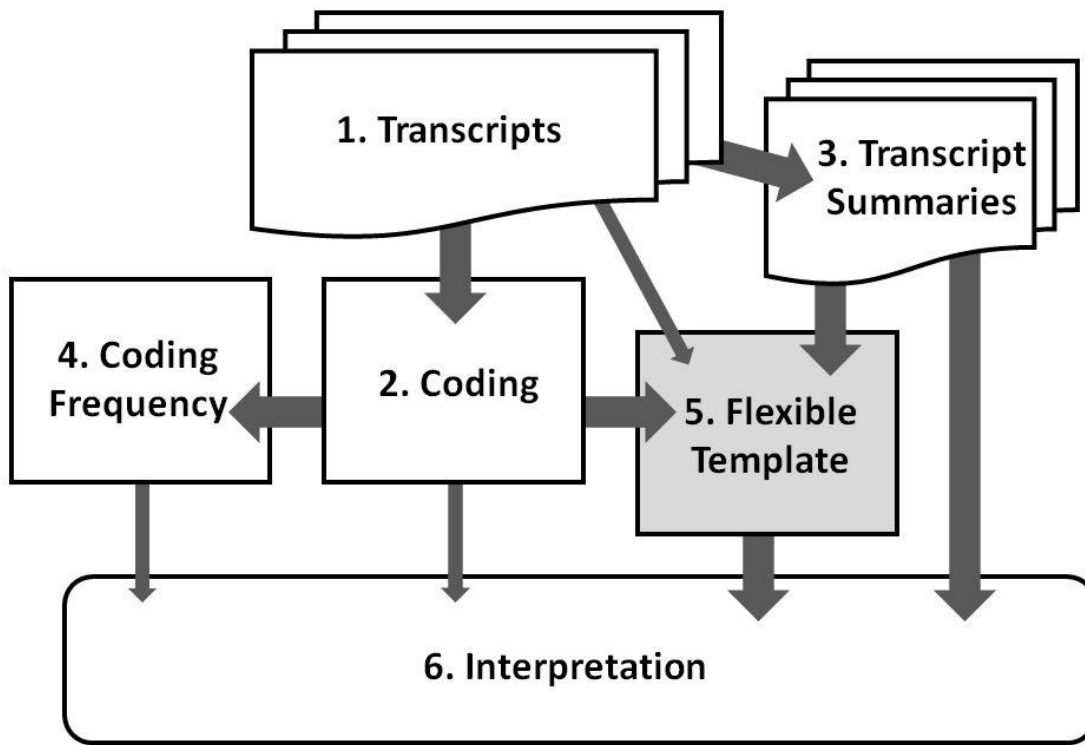


Fig: 5.3: Data analysis process and information flows, relative to flexible template.

Creating the coding analysis of the five interviews so far had given the researcher understanding of the interview data. The Transcript Summaries were being developed alongside the coding and were proving helpful in recording what were seen as important elements, based on ethnographic observations thus far and the transcription process. In combining the two analysis elements of knowledge acquired from the coding analysis and the Transcript Summaries, the researcher was able to articulate themes from the data.

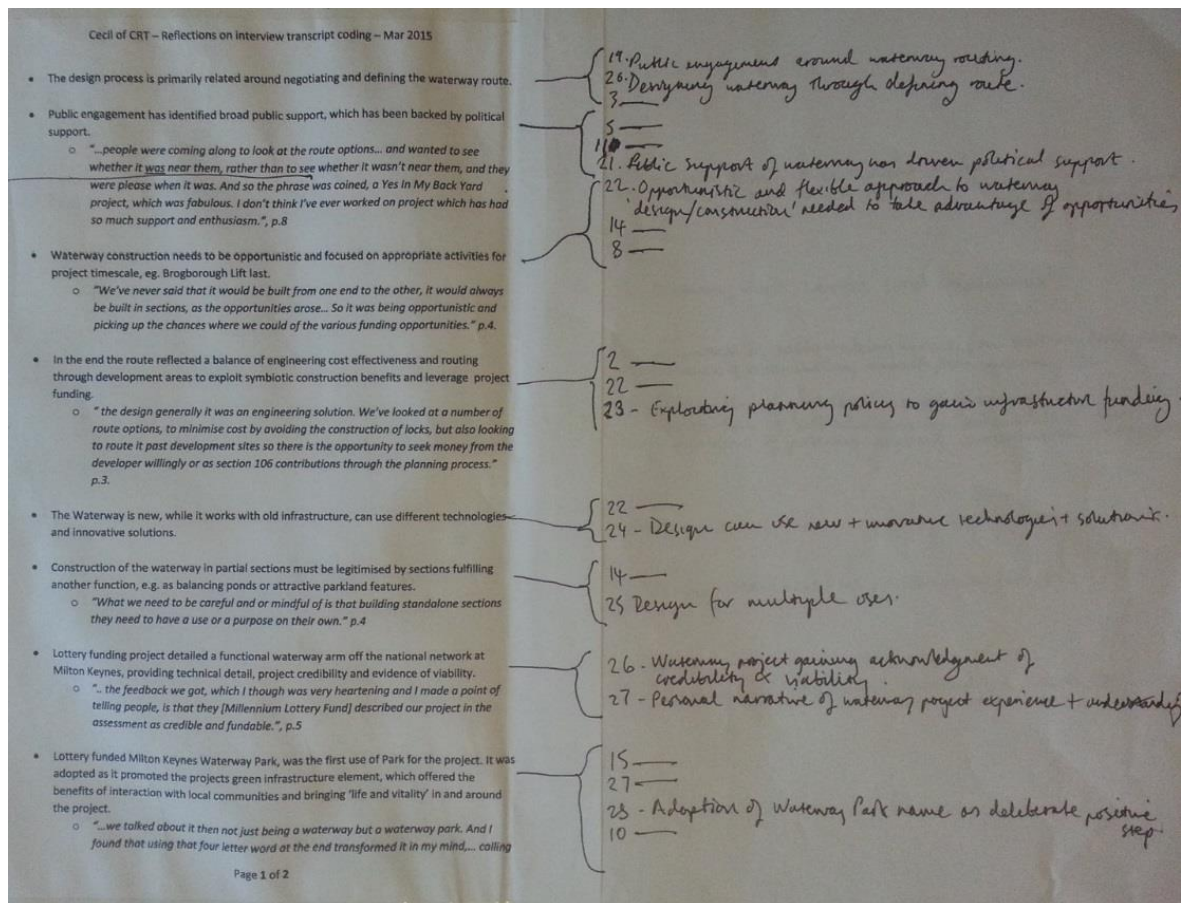


Fig. 5.4: Section of an initial Transcript Summary analysed using a flexible template approach.

Working through each of the five transcript summaries more flexible template themes were built up, using hardcopy transcript summaries to annotate and capture the themes identified, as shown in figure 5.4. Through this analysis, 54 themes were identified. This resulted in a numbered list which needed translating into a template in order to be made feasible for use in the analysis of the remaining five interview transcripts. The themes underwent a clustering analysis in order to identify how the themes would fit into groups. Eight theme groups were identified which encompassed all the themes identified thus far, and these are listed in table 5.4. In this way, the flexible template was created with themes arranged in groups.

Table 5.4: Flexible template theme groups and their final number of themes

Theme Groups	Number of Themes
Design	15
Requirements	19
Sustainability	5
Opportunities	26
Agency	9
Pragmatism & Flexibility	9
Participation	8
Situatedness	4

The remaining five interviews were analysed to produce transcript summaries, which were in turn analysed using the flexible template. New themes were identified through this process and added to the flexible template. Once all the interviews had been analysed using this method the flexible template was complete, with a total of 85 themes identified. These were distributed between the nine different theme groups as shown in Fig.5.4. The completed flexible template from the analysis of the interview data is shown in Appendix E.

5.6 Interpreting the Interview Data

This section details the interpretation of the interview data analysis and its relevance to the research questions. The data interpretation is presented in eight sections, one each for the theme groupings of the flexible template. The interpretation sections each start with a listing of the themes in that grouping. After each individual theme is an alpha numeric identification in brackets. This identification scheme was used throughout the data analysis process with the flexible template, and has been retained to assist with any future referral back to the original data analysis documentation. The interpretation also includes many quotes from interviewees, which are identified with a brackets containing the name of the interviewee and the interview transcript page from which the quote is taken, e.g. (Chris, p6) is a quote from interviewee Chris and found on page six of the interview transcript.

5.6.1 Design

These themes relate to the design activity within the case study project, where design is the action taken by case study actors to create the waterway.

Flexible Template: Design group themes

What is being designed?

Designing waterway through defining its route (D2)

Design activity focusing on blue infrastructure (D13)

Design process, exploratory and responsive (D15) (link to PF3)

Design changes made to achieve a better outcome (D14)

Who is designing?

Design details on where land development occurs on route (D10)

Design seen as activity undertaken by technical experts (D11)

Control of the waterway design process (D1)

What design visions are being created?

Design visions based on existing infrastructure paradigm (D6)

Design visions based on solutions to technical problems (D7)

Design visions based on possible new futures (D5)

What future design activity is suggested?

Design can use new and innovative technologies and solutions (D4)

Design influenced by local community (D12)

Design for multiple uses (D3)

How is design being communicated?

Design visuals communicating to experts (D9)

What is being designed?

All interviewees, apart from Mike and Katie, mention that design activity on the waterway is most commonly focused on defining the route. Interviewees identify this with pragmatic need at this stage in the project timeline in relation to the need to prioritise the securing of the waterway route, to address technical details, to avoid potential route barriers and to take advantage of route side land developments. This is supported by ethnographic case study observations of design activity and by the dominance of the A-Z Project Delivery Plan in different stakeholder discussions.

Early stage project design activities are described in detail by Cecil, where he relates his design process of negotiating and defining the waterway route at a series of engagement events with the public along the potential route. As the waterway route is now well defined and captured in the A-Z Plan, it appears to have been deemed necessary to focus design activity on ensuring this route is not blocked. Many of the interviewees identify that this focus has caused a preoccupation with the 'blue line' infrastructure of the waterway:

“...there is a tendency to focus on getting a sort of ‘wet conduit’ from the Grand Union to the Great Ouse. And there is a minimum specification for what that can be 5 meters wide and it could be a concrete box all the way along...” (Chris, p.3).

This is not what Chris thought the BMK Waterway was intended to be or what he wanted it to be.

Saffron warns of the negative effects this could have on the waterways design:

“...the waterway isn’t just an engineering challenge, it’s got a lot of wider environmental benefits that we need to think about designing in as well, you can’t just design [elements] at the last minute especially if you are designing ecological and recreational networks, it needs to be thought of in a joined up way...” (Saffron, p.16).

With a lot of effort focused on the technical challenge of the waterway, it is the park element and its green infrastructure that Chris and Joe fear will get forgotten or side-lined. However, these elements are central to the value of the new infrastructure, as pointed out by Saffron:

“I think sometimes the challenge of how we physically get a waterway channel from X to Y has meant there’s been less of a focus of how can we get the added value of the more park element of it ... people sort of assumed that the easy sections, where there aren’t so many constraints or level difficulties, will just sort of fall into place...” (Saffron p.3).

As the waterway project has progressed over time, and its route become more tangible and defined, pockets of land alongside the route have been developed. The ethnographic research identified a Trust policy to exploit the opportunities the land developments present (see section 4.3.3), and this has had an impact on design activity. Where adjacent land development takes place, the Trust’s design efforts have been responsive to that emerging context and the demands of the developers. Saffron identifies the impact from this policy:

“...because we are taking an opportunistic approach to deliver the waterway, it’s the more built development heavy sections that we are looking at first, which means it’s the more constrained sections that are being designed first. ...actually most of the route is going to have a more rural, open and informal setting.” (Saffron, p.5)

In response to this circumstance both Chris and Saffron call for the existing, and often constrained, designs to be balanced with proposals for greener rural sections that would communicate the variety of the whole waterway and the benefits its green infrastructure can provide.

Timothy argues that this responsive design process brings about changes that are made to achieve, as he phrases it, “a better outcome”. He points to the potential for a positive impact on both the desirability of the waterway to the user and the deliverability of the project, through gaining land access and, importantly, financial assistance. The ethnographic research provides evidence for and against this argument, in the beneficial effects of the Marston Innovation Park

and the negative effects of the Gallagher distribution centre. In both these cases the Trust was responsive to the opportunities the developments offered and willing to make changes to the waterway route, but with widely different outcomes (see section 4.3.3).

Who is designing?

The policy of driving the waterway projects progress through the route side developments became central to interview discussions about where design activity was taking place and who was doing it. Zack enthused about the benefits of this opportunistic design and development process, which he felt would enable different sections to be constructed over time:

“The whole notion of the A-Z thing is actually that the building can be opportunistic as well. Here is a development happening in this particular patch of land, it can establish at the moment what will be a disconnected little stretch of water but ultimately that will be a section of the waterway, and that is such a brilliant idea. It just makes it all so doable.”

(Zack, p.3)

The Trust want route side developments to include the waterway in their development design, with Timothy voicing the Trust's willingness to be flexible and change the waterway design to appeal to developers:

“...our approach to design is extremely pragmatic within the lofty aspirations of the sort of waterway we want to build, and the opportunism of finding certain circumstances in which by tweaking it slightly or morphing it slightly we can make it more appealing too whoever it is has to be seduced.... we don't know until we actually get down there and talk to whoever will be there when we are actually implementing the scheme we don't know how we might need to fine tune it down there.” (Timothy, p.3)

While the aim of the Trust to benefit from land developments around the waterway is plausible, it is only so if it is accepted by other actors, namely the developers, as part of a larger design vision. For example O&H Properties own land on the waterway route in the Marston Vale which they wish to develop for housing. Katie confirmed that O&H Properties recognised the potential

benefits of the waterway and wanted to build it into their design vision for the site, but in a way that is determined by their design process and not one dictated by the Trust:

“...whatever they [B&MK Trust] show going across our land is pretty irrelevant...at the appropriate time we will enable a route across our land based on what our engineers tell us... It’s our land and we will do what we want on it.” (Katie, p.5)

The interviewees shared a wide range of opinions on who is conducting design activity. Many saw design as the domain of professional experts: civil engineers determining the line and level of the waterway sections traversing the landscape; landscape architects mapping the area surrounding the blue infrastructure of the waterway as it interacts with the urban and country regions surrounding it. Marion described design activity as adding technical detail, such as through line and level engineering drawings, and was something done by other organisations and professional experts, such as civil engineers. While Mike went so far as directly dismissing anyone other than ‘specialist consultants’ being involved in design activities. Other interviewees, such as Zack, Timothy and Chris, demonstrated a more flexible understanding of design, more akin to design thinking (Buchanan, 1995; Brown, 2009) and were more willing to consider design activity as something volunteers, amateurs and the public could provide a meaningful contribution to design.

Many interviewees expressed concern over who had control of the design process in relation to route side developers determining their own waterway design activity. For example Joe voiced these concerns, saying “I think particularly where the waterway is related to development sites then they will become fairly precisely defined by the development itself.” (Joe, p.5). Zack went further voicing his, and others, concerns, “...the danger is that we are at the whim of the developers and we end up with what they choose to give us.” (Zack, p.5). As land developers have ownership of the land and funds available to employ design professionals they are in a strong position to control the waterway design within their sphere of influence. Katie is unsympathetic to the Trusts concerns, stating “If you’re working on a sort of opportunistic ‘we’ll take it where we can get it’ approach you’re not going to have any control over the detailed design, it’s going to be

the owner or the person doing the development” (Katie, p.13). She makes O&H Properties position clear, “we would rather say to the trust ‘we are going to bring forward this development, this is the route we propose, what do you think?’. We would rather control it than be dictated to.” (Katie, p.5).

What design visions are being created?

The design visions described in the interviews broadly reflected the three visions identified from the ethnographic data (see section 4.3.4). Firstly, some design visions were primarily based on the historical waterway infrastructure paradigm. These visions were aligned with the ‘Canal’ name and wanted the BMK waterway to recreate the historical waterway infrastructure that already exists.

Secondly, a group of design visions were based on the current waterway paradigm, driven by the desire to address real world technical problems and were aligned with the ‘Waterway’ name. This vision was articulated in the Developers Guide (BMKWC, 2013) (see section 4.3.3), which focused on the benefits of the waterway for developers and the practical requirements to fit the waterway infrastructure within their development. The most detailed and considered design vision of this type was provided by Mike, as he discussed what kind of waterway design would be needed to cope with extreme rainfall. He described an infrastructure operating under the full impact of flood risk mitigation:

“...with these little watercourses they tend to be very rapid in the way they respond to the rainfall in a smaller catchment, so you might have 2 hours’ notice that your river level is coming up... not long enough to issue navigation warnings... So how is it handled? ... Do we close it on the risk that it may rain 10mm, it may not.” (Mike, p.6)

In considering the technical impacts upon the BMKW design that this scenario requires, he chose to focus on the challenges it presented to user scenarios. Mike described the resultant negative impacts upon the BMKW to support his critique of the project:

“Yes engineers can design it, you could have no stop sections or have floating moorings ... But if you put too many restrictions in place then you might discourage people from going on it because they think it might be dangerous, or lose [financial] benefits because you are getting them through it as quickly as possible...” (Mike, p.11)

Finally design visions were evident which focused on imagined possible new futures and the beneficial ways the waterway might differ from the existing inland waterway infrastructure paradigm. These visions were aligned under the ‘Waterway Park’ name and had several champions within the case study actors. Promoters of the Waterway Park design vision were keen that the BMKW project fully integrate green infrastructure alongside the water element.

In describing her vision for a future BMKW Marion built on the functionality based around water that the blue infrastructure could provide:

“the whole theory is that it’s not just a canal, just of a certain width with a towpath running alongside it, but it becomes ‘a waterway for all’ with footpath/cycleway, and associated bits and pieces, such as.....if you like, small leisure facilities along the route... along parts of the way I dare say there will be provided routes for horses as well. So it will be a walkway, a leisure facility for all, not just boaters.” (Marion, p.2)

She didn’t use the Waterway Park name and chose instead to reference the ‘Waterway for All’ tagline marketed by the Trust. However, all the wider activities she was associating with the BMKW would be enabled by, and were dependent upon, the development of the green infrastructure part of the BMKW. She focused on wider social inclusion and public participation as benefits, which fit well with her previous career in regional politics.

Other interviewees expanded the scope of the Waterway Park vision, focusing in on certain aspects, such as the potential transport benefits of the waterway towpath for locals and commuters. For example Joe talks of the creation of a new transit corridor, integrated with existing national cycle routes. Cecil describes commuters and tourists hiring electric bikes to take advantage of these new transport opportunities, in what academics would see as an integrated

Product Service System (Cook, 2014). He goes on to describe other engaging narratives, such as a glass aqueduct traversing the M1 and a sculptural boatlift over Brogborough Hill which provides a significant visual landmark. In Cecil's vision of the future these two remarkable features would make the BMKW a major regional tourist attraction.

The Waterway Park design visions promote a new geographical corridor between Milton Keynes and Bedford, connecting local communities, providing public access for transport and recreation, and also, importantly, benefiting wildlife and providing eco system services. Design visions such as that promoted by Chris:

"...the vision for the waterway which we [Marston Vale Trust] subscribe to, which is why we support it as we do, is about this more natural corridor which has a waterway within it, but that itself is designed to deliver ecological benefits, recreational benefits in terms of how you manage that corridor. It will vary in width from 5 to 50 metres depending on what your opportunities are and so on." (Chris, p.3)

Timothy populates the Waterway Park with people, describing how in his vision there would be multiple opportunities for leisure activities including environmentally focused activities but also those possible within built up areas, such as shopping deliveries by boat:

"...our aspiration should be to go for something that has a multiplicity of uses, is a plurality not a singularity, and when you have potentially sixty different things that you could do in your local bit of waterway you're likely to get much stronger local use of it..." (Timothy, p.8)

He goes on to describe a vision of the waterway as a common good, where it could be offered as part of 'waterways on prescription', providing a free source of physical, mental and social therapy.

While the Waterway Park design vision had some support in the BMKW project, being seen as a development of the Trusts stated 'Waterway for All' aspiration, it still, according to Saffron, needs to be promoted within the BMKW supporting actors:

“I think it is something that constantly needs to be kept on top of, communicating the [Waterway Park] vision, constantly communicating the message that it’s not just a waterway, it’s a waterway park... it sometimes seems to be the first thing that drops off the agenda.” (Saffron, p.4)

For Chris, one of the Waterway Parks most vocal champions within the interviewees, the Waterway Park is the only worthwhile design outcome. He promotes the vision by calling for design action, stating its achievability and huge potential:

“With a bit of intelligent design and some lateral thinking, sort of interdisciplinary work, you should be able to extract some phenomenal benefits out of combining all those different features, environmental, social and economic benefits. That’s the challenge, to design it in a contemporary way, or even in a way that looks to the future, weaving those things together.” (Chris, p.4)

What future design activity is suggested?

Many of the interviewees identified that the waterway design should not just be the recreation of historical canals and adoption of old technologies, but recognise that it is a new infrastructure and it can utilise different technologies in creating new innovative solutions. Zack highlighted this as something they needed to address:

“I’m not sure whether yet we have got to grips with the potential of this as a 21st century structure, because what we are building is an 18th century piece of engineering with 21st century knowledge, and it changes all the rules. In fact it removes most of the rules. We know we’ve got to go up and go down, so we need locks, but do the locks have to function the way locks always have? We won’t have hard sides, except were we have got to have them. So we won’t have a towpath that slavishly follows the water, which is bad news to the horse boat society but magic to everyone else because it means we can have soft edges which are friendly to wildlife, it means that the towpath can wander away from

the water and leave spaces for fishermen to sit on undisturbed or go and take advantage of a view, or whatever.” (Zack, p.3)

Ensuring the waterway infrastructure was suitable for multiple uses was highlighted as a desirable design requirement by many interviewees. Contemporary inland waterways are used for many more activities than was the intention when the historical canal network was designed, and several interviewees recognised that design can, and should, help this multiplicity of use. Timothy stated the waterway design shouldn’t make one activity dominant, but allow for others to happen within its space. While Saffron suggested that the waterside green space must “design out conflict” allowing multiple users to happily engage in different activities at the same time, from commuting cyclists to older wheelchair users.

This change in use was expected to continue through time, and to be accompanied by change in the demography, culture, and aspirations of the surrounding communities. Timothy predicts that “the nature and purpose of what we have built will change as people use it differently, and we can’t necessarily anticipate how they are going to do it” (Timothy, p.7). To understand, embrace and allow these changes some interviewees recognised that the waterway design should be influenced by the local communities. Gaining wider public participation in the design process was seen as one way of achieving this goal. However, they acknowledged that the participation in design activities by local communities had thus far been lacking and that more was needed to be done to facilitate this. This subject is covered in more detail within the participation theme group section following.

Communicating Designs

The ethnographic chapter has identified the range of artefacts created within the case study, such as the A-Z Project Delivery Plan (BMKWC, 2012), through which design work is captured and communicated. Through the interviews the participants spoke about these artefacts and what they had seen, what they thought worked well and what they felt was missing (both in terms of

artefacts and actions). They felt the role of design communication had to have relevance to three main audiences: professionals, volunteers and the public.

Zack was currently leading the Trust's communications team and gave his summary of how they were communicating the waterway design. He identified that public communication activities had generally lacked strategy and mainly involved presenting talks to public groups who had requested them and exhibiting at public, primarily boating, shows. Waterway designs were communicated through the Trusts display boards but historically had not been done well. Updating the display boards was an aspiration but had proved to be difficult, partly due to lack of volunteer skills. Where Zack thought they had done well was keeping the waterway in local media through feeding their news stories to local press and local parish newsletters.

As relatively neutral actors operating outside the Trust, Katie and Mike presented a different perspective. They both agreed that the present waterway designs contained in the A-Z Guide were being effectively communicated and promoted the waterway to the public in simple terms. O&H Properties and the IDB, they said, needed to see the waterway design in more technical detail in order to get involved, but accepted this level of detail was mostly not available at this time.

In discussing design communications, Trust interviewees and those directly involved in the BMKW project agreed that the A-Z Guide was suitable for public viewing, and also acknowledged its effectiveness for project planning, with its division of the route into sections and its compilation of relevant data. They also mentioned the Developers Guide (BMKWC, 2013) providing valuable information for planners, land owners and developers on what the waterway could be, but Saffron raised concern over it only presenting guidance on minimum dimensional requirements. The position of these case study actors also gave them sight professional technical information from civil engineers. Even with oversight of all these communications tools Saffron was concerned that design issues were being missed, "we do need to make sure that the environmental benefits do get delivered by the project and they come out really clearly in all the documentation that goes alongside the project" (Saffron, p.3) Timothy identified visuals and maps as good ways of

communicating design, to simplify the technical detail of the project so that it can appeal to multiple audiences. He stressed the importance of providing visuals of imagined futures in persuading people of the 'realness' of the project while in progress:

“...you are able to convey an imagined future in which this thing will actually happen. Because the most important thing when conveying a public message about something like this, which is so widely ambitious and unaffordable, is being able to convey that this is a plausible proposal, it’s not a completely loony, daft, pie in the sky proposal, it can be done, and nothing persuades people more than a visual that shows them a situation where it has been done. That is the essence of plausibility, showing what it will look like once it has been done, and the more you show them that the more they will believe that it has been done, therefore there is no point in saying it couldn’t be done, because it has been done.” (Timothy, p.5)

This aligns with Chris's view which highlighted the current design challenge as detailing and visually communicating what a Waterway Park could be. There is then, in the interviews, an expressed need to show people what the full range of benefits could include and where along the identified route they might be realised. This discussion is expanded in the ‘Improving communication’ sub-theme in the following Requirements theme group.

5.6.2 Requirements

The requirements theme group addresses the functions that the infrastructure should perform and the actions needed to deliver it. The theme examines what the interviewees want from the infrastructure, how they specify what it needs to provide, and the requirements for enabling delivery of the best outcome. At the time of the research the waterway design was generally lacking detailed definition and its requirements were fluid, with different actors providing their support for those they thought valid.

Flexible Template: Requirements group themes

Enabling delivery

Desirable actions driven by legal requirements (R7)

Waterway needs to be written into local authority plans (R12)

Waterway sections need planning permission for project progress (R13)

Prioritising economic benefits of infrastructure (R9) (link to Opportunities)

Water management

Requirements for water bodies (R6)

Water management to safeguard from flood risk (R5)

Waterway design to be resilient to future changes (R4)

Enabling best outcome

Innovative use of appropriate technologies (R15)

Waterway standalone sections must provide useful benefits (R10)

Waterway project only worthwhile if green infrastructure benefits are realised
(R1)

Identify areas with greatest potential for Waterway Park green infrastructure
(R16)

Waterway design to be resilient to future changes (R4)

Waterway design needs to support a wide range of actor groups and their
activities (R2)

Mutual benefit to actor groups (R8) (link to Agency)

Waterway retains coherent character (R19)

Connecting the waterway to people

Waterway must benefit local communities (R3)

Waterway character to reflect local community (R14) (link to Situatedness)

Communities along waterway value it because they are connected to it (R17) (link to Agency & Participation)

Improving communication

Need design visuals which communicate imagined futures (R18) (link to Design)

Need designs that communicate the Waterway Park vision (R11)

Enabling delivery

The Trust policy to progress the BMKW project through land developments requires that the waterway designs obtain outline planning permission. Once this permission is gained from the relevant Local Authorities this gives the waterway project some legal standing. Developers are then legally required to provide for the route within their developments either through planning gain funds or the gifting of land. This position was evident in the case study through ethnographic observations and reinforced in the interviews by several of the participants. Marion described the Trusts historical focus on acquiring 'in principle' planning permission for the waterway route as a method to acquire planning gain funds, and also to provide leverage for access to other funding sources and types of support:

“the BMKW Trust put in a further lottery bid, this time it was for the living land marks scheme, and that happened 2005 to 2007, and during that period they received a quarter million pounds which was used to refine the route through MK, gave the trust the opportunity to employ at that end a full time employee and project officer, and to seek planning permission and get line and level drawings for most of the length of the waterway.... it enabled us to get in all the local plans and it gave us the opportunity to start to make the waterway a reality and since then we have had an underpass put in under the new A421, and we have got two more sets of planning gained.” (Marion, p.2)

Several interviewees pointed to the importance of highlighting the potential future economic benefits of the completed infrastructure. Economic benefits were highly prioritised in

assessments for planning permission, project funding applications and the generation of political support.

At the time of the research, Section 106 of the Town Planning Act provided legislative access to planning gain for the BMKW project. However Saffron described an update to planning legislation. The UK Government had reacted to political pressure from developers, concerned over how much money was collected from them and what it was used for, and introduced the Community Infrastructure Levy (CIL) which would take funds from developers for regional infrastructure projects. Section 106 would only be able to fund projects very local to a development, whilst CIL would fund a limited number of regional strategic infrastructure projects, identified through a LA led process of public consultation. Saffron identified that each LA was working out how to implement these changes and that the impact on BMKW project funding was unclear, but was assured that:

“...what we will continue to do, irrespective of how we implement the legislation is that where the waterway is on site, we will try get it delivered directly through the planning system” (Saffron, p.14).

Whatever the outcome of these changes to legislation the developers would be affected. Katie suggested a potential solution to alleviate the pressure on developers that the green infrastructure element of the waterway should be taken as part of this contribution. This would provide expert oversight of green infrastructure delivery and relieve land requirements on developers.

Enabling water management

The ethnographic research identified that many Trust actors had a naïve and simplistic attitude towards water management (see section 4.3.2). However some case study actors and interviewees identified water management as an important issue. In doing so they also identified the Internal Drainage Board (IDB) as an actor group with legal power and technical expertise in regional water management. Saffron thought the BMKW project really needed to access their

knowledge and get them to help present the waterway more positively, while Joe said their opinion and position are not fully understood.

One of the last interviews to be undertaken was with Mike of the IDB who was an expert in water management. He explained the organisation's responsibility to manage the existing manmade system of watercourses by minimising flooding through extensive powers granted by various legislation. They could enforce maintenance work on the riparian owners of watercourses, or undertake the necessary work to reduce flood risk themselves, as "you're relying on 1000's of riparian owners and rarely can you get them to manage the system for the common good" (Mike, p.2). The IDB also provide expert advice about alterations to existing watercourses in their area and it is in this capacity that they interacted with the BMKW project, advising LA's and the BMKW Consortium.

The interview with Mike mainly focused on the technical issues of water management, especially how they apply to the immediate region and in turn the proposed waterway. He provided detailed explanations of the requirements of the water bodies along the BMKW's proposed route. Mike emphasised that the existing system had been created gradually over hundreds of years, was mindful of history and took a long term view. This position explains the IDB's, cautiously neutral position on the BMKW project, as it represented an unclear future risk. He made clear that the requirements for the BMKW and those of the surrounding waterbodies were different, and often contradictory. The BMKW Trust looks to the lakes along the route as reservoirs to feed the waterway. Mike compares these requirements to those of the IDB, "we both talk about water reservoirs, they [B&MKW Trust] want theirs full and are concerned if the water level starts dropping, we want ours empty and are concerned when it goes up and want it to be empty as soon as possible"(Mike, p.3). As a contrast, Marion of the BMKW Trust summed up the Trust's simplistic view of the BMKW's water management requirements, "So it's the management of [surplus] water that is required, rather than new sources for water. If you look along the [route] there are plenty of areas where the water can be picked up... you've got lots of flood areas that you're going through, where water can be stored. At the moment it just tends to drain away"

(Marion, p.5). The tension between these views substantiates both earlier ethnographic observations over the Trust's grasp of water management issues and IDB's caution towards the BMKW project. Mike expressed further concerns:

"A classic concern I have is, taking 2 hours as an indicative time of warning, if you are a boater and you have nipped out to a pub for lunch or pint... It could be a couple of hours till you get back to your boat and if you have tied it down too tight it could have sunk, if you haven't tied it down well enough it could have been ripped away by the increased flow and be stuck on a sluice or somewhere that is increasing flood risk." (Mike, p.7)

Several interviewees anticipated that future water management issues would be adversely affected by climate change. Saffron explained how climate change will drive changing regional water management issues:

"I think surface water management, water storage and water quality are going to become increasingly important. Again, that's something that might affect the design of the waterway in terms of how it can store water, how it can treat water, how it can use water sustainably, so that might be something that would factor into the design." (Saffron, p.11)

Mike presented IDB's concerns that future climate change would increase extreme weather events. This would mean more frequent occurrences of extreme rainfall, bringing higher flood levels and greater risks of flooding. Consequently Mike felt any waterway design is required to consider and accommodate these more common extremes, in order to offer some resilience to future changes. He uses his viewpoints to create the problematic scenarios described earlier, of an inland waterway based on the technicalities of extreme water management.

Enabling the best possible outcome

This group of Requirements themes focus on enabling the "best possible outcome", a term used by Timothy in describing the goal of his efforts working on the BMKW project. For the purposes of this research "best possible outcome" means finding a credible balance between the opportunities available, timely project progress, cost implications and end user happiness.

Addressing IDB concerns, Chris felt that with some “effort and intelligence” it would be possible to create a water management system that effectively dealt with flood management and met waterway requirements through the innovative use of appropriate technologies. Zack also envisaged a scenario where innovative technologies would help deliver infrastructure appropriate for its time:

“I’m not sure whether yet we have got to grips with the potential of this as a 21st century structure, because what we are building is an 18th century piece of engineering with 21st century knowledge, and it changes all the rules. In fact it removes most of the rules. We know we’ve got to go up and go down, so we need locks, but do the locks have to function the way locks always have?” (Zack, p.3)

The majority of Interviewees shared the opinion that the waterway should employ a pragmatic construction methodology, which would see partial sections delivered over time. This was driven by the lack of available funding to pay for the waterway to be completed as a whole, and that progress thus far had been on the back of route side land development. Cecil emphasised that to get the best outcome, while being built in this piecemeal way, it was required that each section be built to provide some positive functions: “What we need to be careful and or mindful of is that building standalone sections they need to have a use or a purpose on their own” (Cecil p.4). The partial sections would then become what Joe termed “linear ponds”, legitimised by fulfilling multiple roles such as pockets of scenic parkland; catchment water sinks for water management, and habitat for wildlife. In this way the delivery of waterway sections serves both short and long term goals successfully, whilst catering for multiple actor groups. Saffron emphasised how this could be useful to developers:

“...when we were discussing with developers, a lot of their thinking is ‘well the waterway will only work as a whole waterway so why should I contribute to a little chunk of it?’...but actually individual elements can deliver in their own rights, so it could be an attractive water features or SUDS as part of a development or provide in or out-coming routes for

right of way... we can help them to see that it's not something or nothing, it is something that you can do incrementally..." (Saffron, p.2)

These linear ponds would become pockets of Green Infrastructure, providing associated functions, before they were joined up at a later date to become the completed inland waterway infrastructure.

It was a common opinion among the interviewees that the BMKW project was only worthwhile doing if it delivered the Green Infrastructure (GI) element of its ambition. The actors who offered this opinion, both in the interviews and the ethnographic observations, were also keen promoters of the Waterway Park design vision. They argued it was a key requirement to develop GI alongside the 'blue infrastructure' of the waterway wherever possible. The GI elements would support the vision of the Waterway as a park, with the water routed through sympathetic landscaping of woodland, passing alongside grasslands allowing easy waterside access for the public and in some places allowing the waterway to open out and blend into wetland habitat. Chris stated that the Marston Forest Trust's support was given only on the understanding that the BMKW project would deliver on both blue and green infrastructures, thus maximising benefits and appeal, "Environmentally if the design is right and it delivers on the environmental regeneration objectives, socially it provides a huge recreational spine through the core of the vale" (Chris, p.1). Joe and Saffron both added that only by providing GI elements would the BMKW project meet the expectations of partner organisations, become cost effective, fulfil its role as assessed in the environmental/economic impact study.

Providing both green and blue infrastructure within the BMKW project would create a landscape that could play host to a many different actors and activities. This requirement for the waterway design to support a wide range of actor groups and their activities was identified by interviewees as necessary for the best outcome. An exclusive water corridor designed for boaters would not provide this. The combination of the two infrastructures would draw in users, as Zack describes:

“...if you look at who is engaging with the waterways directly many, many times more of them will be out of the water than in the water. [A previous director] said some time ago ‘the point of the blue bit is to make the green bit pretty’, and I think that is a very, very wise observation. You know you could stick a path between Bedford and Milton Keynes and it would be a very dull thing. You stick a waterway through and you actually have a stunning path.” (Zack, p.5)

As the waterway runs along its route it passes between the towns of Milton Keynes and Bedford, and in so doing through many different districts and village. Interviewees were concerned that these local communities should get involved with the waterway, so that they could influence its design, which would then reflect their interests and benefit them in ways they wished. Zack saw the waterways design changing with the local communities it passed through:

“...our attitude is that there is nothing wrong, and in fact there is everything right, with the waterways character changing, within certain parameters, but for the waterways character changing from one community and another. So that there is a community identity rather than a linear identity right the length of the water...” (Zack, p.5)

Timothy hoped that in this way the communities along the route would start to feel connected to the waterway, “we want a waterway park that connects MK with Bedford, and is held in the hearts in the communities through which it passes...‘how do you design the love around a waterway?’, that is the challenge” (Timothy, p.4). It is through influencing and being content with the waterway that Zack thinks the local communities can help increase the longevity of the waterway:

“Which comes back to question of how the communities through which it passes feel about it, whether they feel it’s theirs, whether their footprint is on it, whether they have control of some aspect of it, how it looks or works or whatever. Because without that it’s quite possible that it will just degrade.” (Zack, p.6)

These requirements are addressed further in the Participation theme group.

Communication

Those interviewees who promoted the Waterway Park vision were also those who called for better communication of the imagined future found in that design vision. They felt this was particularly necessary as the Waterway Park offered so many accompanying benefits but lacked clarity:

“[someone needs] to do a bit of work that shows actually how the green infrastructure component is going to manifest, at least come up with a concept for how those benefits can be maximised along the currently proposed alignment, particularly as I think that’s where the meaningful benefits to most of the local population will come from.” (Chris, p.13)

Saffron identified that providing a developed design which communicates a section of Waterway Park and its potential would be very useful:

“...designing a section of the waterway that is going to be wider and more naturalistic would be really useful to kind of communicate the message that in other places it’s going to be really broad, it’s going to have sort of sloping edges, there is going to be a path along the side but also much more extensive and informal space as well...” (Saffron, p.4)

5.6.3 Sustainability

The literature review has identified that sustainability is a complex and contested subject. Different meanings are given to sustainability, and different arguments are constructed around it. The ethnographic observations of the BMKW project case study witnessed actors who demonstrated a range of opinions, from climate change denial to a professional level of understanding.

Interview questions 3 and 4 specifically asked participants to discuss the issue of sustainability, as a concept and in particular with reference to the waterway. The range of themes within this theme grouping doesn’t really reflect the full scope of discussion on sustainability. Many topics

were linked into sustainability by interviewees, from water management, renewable energy use, to changing demography.

Flexible Template: Sustainability group themes

Awareness of sustainability issues (SU1)

Awareness of sustainability impacts from waterway use (SU2)

Awareness of sustainability impacts from waterway construction (SU3)

Taking action for the common good (SU4)

Sustainability seen as addressing environmental agenda only (SU5)

The interviewees with the least understanding of sustainability understood it solely in terms of environmental issues and resource use. Marion's defence of creating the waterway through greenfield sites (below), focused on environmental sustainability while not recognising that the fields under discussion were planned for housing developments:

"...although people might say 'you're disturbing the environment by putting a waterway in across these ploughed fields', in another aspect we're actually creating new sustainable habitats for wild life as we put in the waterway. And obviously you're going to attract a different sort of wildlife in those areas, so it will highly ecologically valuable. And if you like we're creating the heritage of tomorrow, today." (Marion, p.4).

She did go on to place the project in the future with the aspirational statement, "We're creating a sustainable environment for the future." (Marion, p.7). Zack followed the infrastructure into the future and recognised the value of the social aspect and the benefits it could provide, "...this sustainability is longevity, so whether it can continue to be an effective functioning thing, there's going to be no shortage of demand of people wanting to use it both on the water and on the land, but it's only really going to be sustainable if people take care of it" (Zack, p.6)

Some interviewees addressed Sustainability from the perspective of their organisation. They clearly had good knowledge and thoughtful understanding about sustainability issues, as demonstrated by Mikes observations, "Very clearly Sustainability today is developing for today's

needs without compromising future generations from developing their needs. So it has to be about the human, natural and historic environment. I think a lot of people mistake sustainability as bio-diversity..." (Mike, p.11). He went on to link sustainability to the potential impacts of climate change, the associated risks from extreme weather events and how these would impact future water management requirements that the IDB would have to manage. Katie stated the position of her development organisation, "We try and create more sustainable places for people... balanced places that are not more harmful than they are beneficial" (Katie, p.12). She explains how whilst the company do not have any explicit sustainability policies they do addresses infrastructure and SUDS requirements, then pass on built environment legislative requirements to house builders, supplying an agreed design guide.

Joe and Cecil showed an informed understanding of sustainability issues. They expanded the discussion to include the social and environmental benefits of the completed infrastructure, balanced with the technical Green House Gases (GHG) impacts of construction and the secondary impacts of knock-on future use patterns.

As would be expected of an environmental sector professional, Saffron understood that sustainability required a good balance of the social, environmental and economic, without any of those aspects competing. She showed reflection on how others perceive it within her LA workplace, "...generally in the local authority sector, sustainability is thought of in terms of environmental sustainability and it's kind of short hand for energy efficiency, renewable energy, low carbon, that kind of thing." (Saffron, p.9). She was one of the few to focus on the economic aspect of sustainability, emphasising the BMKW projects potential to deliver environmental benefit without being a barrier to growth, "...yeah I think definitely the waterway has got potential to deliver massive sustainability benefits, not just from an environmental side but from an economic and social point of view as well." (Saffron, p.10). Her emphasis on economic benefits, evident in the initial frequency coding data analysis, can be seen as a defence against common criticisms of the environmental agenda.

Timothy showed knowledge and understanding of sustainability, briefly mentioning the Brundtland definition (UN GA, 1987) and emphasising the necessity to balance economic viability and environmental gain. He concentrated on the social aspect and the infrastructures potential as a common good to engage and benefit the local communities:

“...this is all about ‘what is a sustainable waterway?’, the more we can engage with the community and the public and the neighbourhoods we go through, the more resource we can get in, the better the waterway will be and the more its maintenance can be nourished by the communities that benefit...” (Timothy, p.9)

Another interviewee with an informed understanding of sustainability was Chris. He judged that the waterway could only become sustainable if the Waterway Park GI benefits were realised. Only then would the net gains outweigh the financial and resource costs, and the recreational benefits of increasing social cohesion and wellbeing be achieved. He acknowledged that the evidence to support these benefits is difficult to quantify, but that the use of Eco-System Services (ESS) assessments would help,

“If you were to evaluate the waterway as we as an organisation see it being implemented, so it delivers on the social and environmental elements as well as the wet conduit bit, if you were to evaluate that using eco-system services as your framework it would deliver a huge net positive outcome...” (Chris, p.6)

Chris was aware that EES was not a generally agreed or recognised assessment method, but could think of no other mechanism that might sufficiently capture the information to support the waterways business case for funding.

5.6.4 Opportunities

Throughout the interviews there was much discussion of the issues that would enable the project and those issues that would act as barriers. Interview question five sought to provoke such issues, although they might have occurred naturally anyway. Themes relating to enablers and barriers

are grouped here under the heading of opportunities, a more neutral term which captures the opportunities that both enablers and barriers might eventually present the project.

Flexible Template: Opportunities group themes

Potential benefits.

Justification for waterway to be built (E8)

Recognition of the potential benefits of the waterway project (E1)

Difficulty in quantifying the benefits of a waterway (B13)

Potential benefits only realised on completion of whole infrastructure (E2)

Recognition of the benefits of the Waterway Park green infrastructure (E11)

Project challenges

Recognition of problems around funding (B1)

Recognition of problems around technical land issues (B2)

Recognition of problems around environmental management (B3)

Legislation as barrier to infrastructure construction (B5)

Historical influences.

Using the historical concept of creating a canal here (E12)

Being constrained by historical canal network precedents (B12)

Long-term horizons

Potential benefits only realised on completion of whole infrastructure (E2)

Using the environment to regenerate an area (E10)

Timescale of project allows design to respond to socio-technical change (E13)

Perceptions of Change.

Timescale of project allows design to respond to socio-technical change (E13)

Problems created by unexpected consequences (B4)

Negative perceptions of change from local actor groups/public (B7) (Link to Agency)

Negative perception of change from expert actor group (B8) (Link to Agency)

Collaboration

Support for waterway project (E3)

Political support of waterway is driven by public support (E4)

Identifying roles for actor groups and organisations (E7)

Conflict between actor groups (B6) (Link to Agency)

Negative perceptions of volunteer led actions (B9)

Not enough volunteers with the right skills (B11)

Creating understanding

Focusing communication to persuade and gain project support (E9)

Miss-conceptions of technical area issues (B10)

Potential benefits

A wide range of potential benefits were identified by the interviewees and used as justification for the waterway to be built. The main practical justification raised throughout the case study was that the project would link up the existing national inland waterway network, “It will provide a cruising circle for boaters to go from Northampton down the Grand Union to Milton Keynes, through Bedford and back around. So it will be very good, it will fill in a missing link on the network” (Marion, p.7). Many interviewees agreed that this new route and resultant navigational traffic would bring economic benefits linked to the service economy associated with recreational activities. Marion focused on the role this would play in regional regeneration:

“Bedford town centre is in need of regeneration. With the link we can bring more people into the centre of Bedford, and if you look at that... [refers to regional map] from there you’ve got Woburn Abbey, we’ll soon have Centre Parcs, you might even one day have NIRA, and one day the link of our waterway. That will be much more of a touristy attraction for the whole economy of the SEMLEP region, and will generate growth and income and jobs and prosperity.” (Marion, p.8)

The assumption and prioritisation of these economic benefits is also highlighted by Bedford LA who decided that it was Joe and his economic development team who would lead the waterway project for them. Marion and Joe both emphasised the importance of having the economic benefit claims quantified and substantiated with the Economic Impact Assessment conducted by credible consultants (SQW Consulting, 2009).

While the economic benefits of the BMKW project were enthusiastically promoted by many interviewees, they were tempered by some with the observation that those benefits would only be fully realised with the completion of the whole infrastructure. Joe suggested that:

“...certainly in these early stages, pre being a totally connected waterway, probably the green space benefits of the gradual development of the waterway park are probably the biggest benefit. Clearly you are not going to develop your canal side attractions really until the whole thing is connected up” (Joe, p.2).

This leads into another theme emphasised by the promoters of the Waterway Park design vision, that only through including and maximising the green infrastructure element would the full scale of benefits be created. Indeed, Joe and Chris questioned their support for the project if it didn’t deliver the important social and environmental benefits to local communities through the Waterway Park design vision:

“I would question delivering it if it was just a canal because I would argue canal users are so relatively few, and the expense of creating it is so great, that I couldn’t see the cost benefit argument stacking up relative to a whole load of other things. But if you’re

thinking of it as a waterway park, so I keep coming back to using that phrase, I think it then becomes cost effective in what it delivers. Suddenly the breadth and scale of the beneficiaries grows massively, and the general benefits to society grow so massively once you start looking at it as a waterway park rather than a waterway that it then becomes justifiable.” (Joe, p.8)

Saffron spoke of her efforts to communicate that the project’s economic viability hinged on delivering a Waterway Park as opposed to a canal or basic waterway:

“I continually need to reiterate, with members of the Waterway Trust and with other partners...for it to meet all of the economic objectives that are based on the recreation elements it needs to be attractive and if it’s just a channel from A to B it’s not going to get those wider benefits and it’s not going to work in economic terms” (Saffron, p.3)

It was acknowledged by several interviewees that many of these more qualitative benefits were important but difficult to quantify.

Project challenges

The interviewees focused on several main challenges to the project. These can be generally grouped as funding, technical land issues and environmental management.

All the interviewees mentioned the challenge of finding funding for the BMKW project in the post-2008 financial climate. Marion bemoaned the lack of regional support and reduced government spending, leaving limited funding avenues (which were previously focused on applications to the national lottery). Access to funding was dependent on securing the route which would in turn be achieved through gaining planning permission and seeing short sections built. This would then prove to funders that the BMKW project was viable and that their money was not going to waste. Defining the route was also identified as a necessary stage in order to accurately understand and manage the overall cost. Most other challenges link back to funding in some way as solving them all involve cost implications.

The main challenge identified by Chris was technical land issues, such as current usage leading to limitations on the land's availability for conversion to a waterway. Joe expanded on these issues, detailing his own experiences with the technical issues of overcoming geographical barriers (roads, drains, utilities). Saffron framed the major challenge around gaining participation from route side land owners, as she felt they were looking for tangible progress to prove the project's credibility. Marion thought that technical problems were not a major challenge as any issue could be overcome with finance; however this was at odds with her statements about lack of funding options.

Two interviewees highlighted the challenges on environmental management. Saffron raised again the challenge of successfully incorporating GI into the overall BMKW project, while Cecil identified the impact that the presence of protected species along the planned route could have through the requirement for costly rehoming schemes. As the waterway route required the modification of existing watercourses which it passes over, Mike pointed out that the Water Framework Directive could provoke a legislative challenge to these modifications if they conflicted with existing requirement to enhance or restore watercourses.

Historical influences

All the interviewees were aware of the historical proposal to build a canal on a similar route to the BMKW. As identified in the ethnographic observations this was seen as a source of pride and embraced as a positive rich historical influence upon the contemporary waterway project.

However some interviewees, mainly those actors who supported the Waterway Park design vision, were concerned that letting the design of the contemporary waterway project be too strongly influenced by the design precedents of the existing historical canal network would be a mistake.

Supporting findings of the ethnographic observations Saffron identified that other national canal restoration projects inspired Trust volunteers, saying of the B&MKW that "...this is a different project with a different vision, because it is going to be a new waterway serving very different

needs to the ones that were created historically” (Saffron, p.6). Timothy added that the history of the BMKW project provides a heritage of ideas rather than of facts, which he saw as a crucial distinction between BMKW and other historical canal restoration projects. The conclusions of these interviewees are summarised by Chris, that this new infrastructure project is not a heritage project to recreate a canal and that it should therefore be very careful not to be constrained by historical canal design standards (Hadfield, 1974).

Long term horizons

Interviewees identified particular opportunities associated to the long term nature of the BMKW project. While interviewees could not agree on the time it would take to construct the waterway, varying from 20-50 years, they all agreed it would take a long time. Katie noted the similarity in project delivery timescales between the waterway and O&H Properties developments (at 20-25 years) which she thought offered a potentially symbiotic partnership because of their mutual need for long term strategic visions.

Considering the current lifespan of historic sections of the existing inland waterways is around 200 years, most interviewees felt that the new waterway would have similarly longevity. It was recognised that different demands and needs would emerge during this period and this presented an opportunity for the waterway to be responsive and flexible in the way it connected to its environment and communities. Chris expected that the future would bring increased demand for contact with nature and spaces for recreational activities, and that the BMKW project as a Waterway Park would be ideally placed to meet these needs.

Change

The proposed waterway represents a significant change to the geography of the landscape it passes through. These changes would have impacts, both predicted and unforeseen. Timothy identifies the need for sociotechnical change and suggests that the designers of the waterway should identify and predict future patterns of use and how these can be designed for now:

“So these will be things which will change how the product of the design is used, how it looks, how it is constructed, what it is for. So we just need to be aware of that because we are occupying such a long timescale stuff changes and we will therefore need to be all the more pragmatic if we are to move the waterway so it stays in the hearts and minds of the communities through which it goes.” (Timothy, p.6)

The vision of the waterway promoted by the interviewees can be perceived as predictions of future change, made up of individual elements that need to be designed into the project at an early stage. The increasing requirement for localised low carbon transport solution can be seen as a basis for Cecil’s vision of bike rental systems being integrated with the waterway towpath for recreational and commuter use. Another example, from Joe, describes how the rising cost of fossil fuel powered freight transport could legitimise the return of freight transport to the waterway, allowing the transport of bulk goods for comparatively little energy.

It was acknowledged by the interviewees that change is most commonly resisted, as it brings with it negative perceptions and fear. A good example of this was given by Katie as she described her organisation’s work to create new housing developments in the Marston Vale as part of UK Government’s 2007 EcoTowns programme. She described how, while their proposals fared well in the government process, the response through the public engagement experience was very negative, and perceived to be fuelled by fear of an influx of people from outside the local communities that surrounded the planned new development. This created bad feeling for her organisation within the local community, and now, “the local people hate O&H because of the Ecotown, hate us. I can’t put it differently than that...The Ecotown was toxic, that’s a good word for it” (Katie, p.9). The waterway route runs through the area that was to be developed through the EcoTowns project and as such these historical public perceptions towards change could negatively impact the BMKW project.

Collaboration

A broad level of support from the public for the creation of the waterway was identified by most of the interviewees. This was evidenced by Cecil as he recalls the response to his early stage public engagement:

“...people were coming along to look at the route options... and wanted to see whether it was near them, rather than to see whether it wasn't near them, and they were pleased when it was. And so the phrase was coined, a 'Yes In My Back Yard' project, which was fabulous. I don't think I've ever worked on project which has had so much support and enthusiasm.” (Cecil, p.8)

Joe confirms good public support for the BMKW project and reasons that this translated into political support, which in turn legitimised the support of Local Authorities through the granting of outline planning permissions, “...it's clearly something that a significant community out there wants to see happen, that's one dimension to it. That was a sufficiently strong view and concept around that view for it to become enshrined in planning documents” (Joe, p.7). While this means that land developments must address the requirements of the waterway within their proposals it does not guarantee their support for the project. Some land owners support and work with the project because they recognise beneficial opportunities for themselves from the waterways creation. For example the MVT is a land owner who is required in their position as a caretaker charity to remain objective and relatively neutral towards local developments. However, Chris explains their position in favour of the BMKW project:

“The reason we are involved is because the waterway is a very significant and expensive project but it is wholly compatible with the Forest Plan which was the strategy setting out the governments vision for regenerating this area between Bedford and Milton Keynes principally through using the environment in an somewhat exploitative way to transform perceptions of the area, to regenerate a degraded landscape, transform perceptions, to stimulate economic and social regeneration.” (Chris, p.1)

Ethnographic observations described the range of case study actor groups who were seen working together over the creation of the waterway, along with their identified roles and activities, see section 4.2.2. Marion states her view of these roles, “So, if you like, the Trust has become the keeper of the vision, and is the body that goes around gently tapping everybody to get things done, whilst the consortium is responsible for actually ensuring that the waterway is built” (Marion, p.3). The ethnographic observations present evidence that the roles are more complex than Marion’s summary suggest, with the Trust doing more and the Consortium less. However the good level of progress made by the BMKW project to date is evidence of the success of these collaborative roles, despite the tensions and conflicts that exist.

The main actors that influence the waterway project are the volunteers in the BMKW Trust. These actors were highly supportive of the waterway project and keen for progress to take place quickly. Many of the professional/expert interviewees external to the Trust were cautious about allowing volunteers too much power, identifying often negative perceptions of volunteer led actions. This led to conflict between the professional and volunteer actors, with volunteers accusing the professionals of taking too long to do too little, while professionals accusing volunteers of being amateurish and estranging valuable project partners. Saffron commented on the example of some Trust volunteers enthusiasm for pushing a DIY volunteer dug waterway and that this was at odds with, and detrimental to, the professional credibility of this big strategic project:

“The enthusiasm is great but that kind of talk just fills me with dread really because there’s been so much work in terms of communicating that this is a professional, high level, strategic project that, having it perceived to be taken forward in this kind of Heath Robinson way is potentially really counter-productive.” (Saffron, p.6)

Whilst Chris highlighted the example of the BMKW trusts attitude to the use of MVT lands by the waterway:

“it’s a useful indicator of the distinction between the rather simplistic and enthusiastic but slightly amateurish perspective/attitude to the waterway which we saw a lot of

historically, which has helped get it where it is, but lacking when compared to the professional, knowledgeable attitude needed.”(Chris, p.5)

Chris went on to temper his comments, saying that the MVT had worked with the BMKW Trust over its history and had seen it become more professional and credible over time. He gave insightful details on a major BMKW project change which had influenced credibility with local authorities and expert groups. In 2005 Andy, a senior civil servant from the Department of Community and Local Government (DCLG), was seconded to the BMKW project as the full time project officer.

“...Andy changed the fortune and prospects of the project entirely. He came on-board and had the difficult conversations with the key land owners around the area, and said ‘Ok, well this is what we would like to do. How could it work for you? What can you get out of it? How can the waterway help your objectives and aspirations?, and those sorts of conversations that no one had had before. So a very significant turning point in the prospects of the project.” (Chris, p.2)

Chris described how Andy understood the professional requirements of a strategic infrastructure project, and conducted the first proper engagement with route land owners. This improved the project management and its deliverability, and led to the identification of the A-Z route sections which were the basis for the A-Z Delivery Plan (BMKWC, 2012). All this project activity at a professional level was fundamental in gaining the support of the local authorities. In turn this contributed to the ability of the BMKW project to bid for, and win, Millennium Lottery Funding. Cecil described the funder response to the BMKW project at that stage, “...the feedback we got, which I thought was very heartening and I made a point of telling people, is that they [Millennium Lottery Fund] described our project in the assessment as credible and fundable” (Cecil, p.5). While this shows the Trust volunteers had improved their professionalism, both the interviews and the ethnographic findings highlighted that more still needed to be done.

Several of the interviewees from the BMKW Trust identified that there were not enough volunteers involved with the right skills to effectively carry out all the activities the Trust wished to undertake. They supported the ethnographic findings that the BMKW boat project had engaged the majority of the volunteer efforts during the early case study period, and was expected to do so into the near future, as volunteers organised and ran the boat trips. They identified that volunteers were needed with the kinds of skill sets to support the prioritised future activities of engaging with local communities and contributing to successful funding bids.

Another aspect to the lack of professionalism within the Trust's volunteers discussed previously is the observation that they often have misconceptions about technical areas issues critical to the waterway. This is supported by both interviewee comments and ethnographic observations, particularly regarding the issue of water management. Here are Marion's comments about a particularly difficult section of the route:

"... in certain areas we will use existing watercourses, for instance through the eastern expansion area of MK we are using the Broughton Brook. So it will be made wider and deeper... turning that brook into a canal doesn't actually cause any additional flooding but in actual fact can relieve the flooding." (Marion, p.3)

In contrast to Mike's professional viewpoint Marion's attitude to flooding implies a number of misconceptions about the technical issues involved.

Several interviewees recognised the need for communications on the waterway to focus more on persuading a wider audience about the merits of the waterway, in order to gain a wider support base for the project. They suggested that current communications, both written and visual focused too much on the technical aspects of interest to current canal users. The interviewees' calls to more strongly promote the Waterway Park vision and highlight its wider green infrastructure benefits offered the potential to address this issue.

5.6.5 Agency

This group brings together the themes which address who has the power in the BMKW project. Who is able to make decisions, influencing action and make it happen? There are actor groups trying to influence the project with different levels of power, and those with the most power are not necessarily supportive.

Flexible Template: Agency group themes

Expert actor group controlling and enforcing (A1)

Expert actors desire for technical design detail (A2)

Actor groups fulfilling multiple roles within project (A3)

Ownership of land and influence over activities therein (A4)

Expert actor groups enabled by legislation (A5)

Volunteer actors contributing to project (A6)

Consortium actor groups supporting and defending waterway plans (A7)

Expert actor groups not fulfilling expected roles (A8)

Actor groups project support influenced by their leaders (A9)

There are multiple actors and actor groups involved in the case study project which have been detailed in the ethnographic observations (see section 4.2.2). The participants selected for interview provided a range of viewpoints, from volunteers to professionals, and organisations representing various levels of project support. The interviewees discussed their own perspective as well as expanding on that of their organisations within the case study. This provided more in-depth detail on the agency of the various actor groups involved across the project.

Several of the interview participants who were BMKW Trust volunteers commented on their organisation. Zack reflected on how the Trust relies mainly on the work of volunteers, but doesn't have the volunteer numbers or skills it requires. However, he observed that despite this, most of the Trust's successes are based on the efforts, skills and connections of its volunteers. Marion

identifies that the Trust is now best served by focusing on maintaining communications and good relationships with LA's and land owners.

Zack also described his personal experience of Trust activities, from joining as a volunteer through to his eventual role as Director. As lead for the Project team he had witnessed a move from the intended role of community engagement to becoming wholly involved in the Community Boat build. He was also responsible for leading the Communications team to make changes, including delivering a new web site. Describing his Trust activities:

“...in the end I caved in, and became a director and a trustee, and then I just got more involved from there, and at the moment I am too involved, its taking up too much of my time and it's causing me big management headaches. The trouble is when you are invested in a project and you see things that need to be done and no one else is stepping forward, if your someone like me it is very, very hard just to step back and ignore those things. So I just get over involved.” (Zack, p.1)

His description of increasingly overwhelming amounts of involvement as a volunteer in the Trust aligns with insights provided by other Trust volunteers. Zack later stood down from any role in the BMKW Trust to prevent his volunteer work load becoming too great and interfering with both his personal and working life.

The BMKW Consortium is an umbrella organisation, gathering together actor groups of major importance and influence within the case study. The interviewees from the Trust reflected upon their understanding and expectations of the Consortium. Zack recognised that a strong consortium which supports the waterway and will defend the plans is important to the success of the project. He considered it necessary that its member organisations communicate this support throughout their departments, as organisational support changes over time, especially with changing personnel. He commented that:

“We're going to have NIMBY's (Not In My Backyard)...you know, 'make it go somewhere else'. So we are going to have that, and this makes the Consortium really important as we

are reliant on the consortium members holding together and holding the line and defending the plan” (Zack, p.7).

Timothy continued this theme identifying that the Consortium, and particularly the Milton Keynes LA Planning Team, were expert actor groups who were currently causing the Waterway project problems by not fulfilling their roles in providing support and action unless pressured into it:

“[The Trust is] trying to ginger [the Consortium] up because they are a rather dozy lot. They only respond to the prodding that the Trust gives them, the Trust being a member of the Consortium. So they are quite a dysfunctional component of the structure we have got” (Timothy, p.12).

Some case study actor groups were particularly powerful and influential through playing multiple roles within the BMKW project. Bedford LA was such an organisation and Joe expanded on their multiple roles regarding the waterway project. These roles included recognising public support and reacting to political pressure, supervising and promoting a regional infrastructure project, whilst also acting as a land owner developing areas around waterway for regional economic benefit.

Actor groups external to the Trust and Consortium could still be powerful in influencing the BMKW project and were represented in the interviews. Mike described how the IDB were enabled by legislation to set requirements around water management that the BMWK project must fulfil, placing the IDB in an authoritarian position of controlling and enforcing. The position of O&H, Properties, represented by Katie, was representative of land owners seeking to develop land along the route. Whilst planning legislation required them to consider the needs of the waterway they still owned the land and had the greatest influence over what activities would take place there. Katie stated O&H’s somewhat contradictory desire to see technical detail added to the waterway proposal by the Trust, whilst also maintaining control of how the waterway passes through their land.

5.6.6 Interpretation against the Fluid Transition framework

The following three theme groupings identify interviews themes aligned to the Fluid Transitions approach (Guy, 2011) and its four qualities: Pragmatism, Flexibility, Participation and Situatedness.

5.6.7 Pragmatism & Flexibility

In identifying the themes through the data analysis it proved difficult to separate Pragmatism and Flexibility, and these two qualities are presented here in one combined grouping. Considering the theme groupings already covered in this interpretation section much that links into Pragmatism and Flexibility has already been discussed, but there are still elements in the interviews that address these themes directly and they are collected here.

Flexible Template: Pragmatism and Flexibility group themes

Trust taking pragmatic approach to focus of activities (PF1)

Infrastructure completed in partial sections over time (PF2)

Opportunistic and flexible approach to waterway design/construction needed to take advantage of opportunities (PF3)

Infrastructure construction progressing through development of route land (PF4)

Exploiting planning policy to gain infrastructure funding (PF5)

Adoption of Waterway Park project name as deliberate positive step (PF6)

Project activity focused on technical challenges (PF7)

Not designing project details that could change before construction (PF8)

Main project priority securing a waterway route across land (PF9) (Link to Requirements)

The focus of the Trusts activities around the BMKW project has taken a very pragmatic approach, influenced by the stage which the project has reached and the opportunities that present themselves at the time. This has to date focused on the technical challenges of identifying and

securing the waterway route. Marion acknowledges the Trusts pragmatic decision on how to currently progress the waterway construction, “where there is an opportunity to get some building work done from a development we do that” (Marion, p.1). This pragmatic approach has influenced the choice of waterway route, which is acknowledged by Cecil:

“the route design, generally it was an engineering solution. We’ve looked at a number of route options, to minimise cost by avoiding the construction of locks, but also looking to route it past development sites so there is the opportunity to seek money from the developer willingly or as section 106 contributions through the planning process” (Cecil, p.3)

He also identifies that this pragmatic opportunism will continue throughout the project’s timeline, allowing it to make progress where possible:

“We’ve never said that it would be built from one end to the other, it would always be built in sections, as the opportunities arose...So it was being opportunistic and picking up the chances where we could of the various funding opportunities” (Cecil, p.4).

Saffron expands on making pockets of progress through planning gains from developments:

“I think it’s kind of a pragmatic approach because... there aren’t big pots of cash around, it’s more how we can make individual elements of the waterway work, kind of, not as separate entities, but how can it be delivered in chunks” (Saffron, p.1).

Zack sees an inevitable point in the future project tipping point when the scale of constructed partial sections brings the project momentum and funding:

“My feeling is there is a critical point that we will get to, when we have got maybe less than half the waterway in place but sections all the way along the route, it will just tip over into, ‘well this is crazy we have only got this little bit to cross and we will have this piece and that piece joined up’, and we’ll start finding ways to get the money or to get the support to do the joining up.” (Zack, p.7)

The importance of allowing flexibility to future change is emphasised by many interviewees who think this will ensure the project remains resilient and responsive to future challenges. This flexibility compliments the waterways synergy with ongoing development around its route, allowing it to reassess and change its routing and design. Joe explains that:

“...when you get into the detailed planning of development relating to a waterway you’re suddenly in the position of asking ‘well actually is that the best position for a waterway?’, and often it isn’t...” (Joe, p.2)

Some project actors demand technical detail to understand and assess the waterway proposal. However, Zack explains how the lack of detail to the overall design can be beneficial and allows flexibility for the design to respond to opportunities at the time:

“That route is now secured in outline regional plans, local plans, so that route is established, but it’s not established in detail. So ‘in detail’ that route is fluid... So there is sort of an opportunistic thing on the section by section level that says ‘Well I know that the line does that, but actually if the line did this we could..’ do so much more, or it would be cheaper, or someone else could realise a benefit which makes it easier for them to support us, or whatever it might be. So in total A-Z it is established, but at the detailed level it’s opportunistic, is the best way to see it.” (Zack, p.2)

Saffron explains further benefits to remaining flexible through a lack of detailed design:

“...because there hasn’t been loads of prescriptive design work done I think it’s still got the space to be quite flexible in terms of responding to how priorities might change in the future. We aren’t going to waste our time developing a solution that might be fit for now, but it’s not going to be necessarily appropriate in 20 years... generally we’ve not done the level of design work to make it obsolete...” (Saffron, p.10)

These flexible approaches in the project take advantage of its long construction time, meaning only immediate challenges have influenced detailed design work. It also combines a pragmatic approach in its acceptance that circumstances will change over time.

Ethnographic observations highlighted the use of different names for the BMKW project, particularly the potential of using the Waterway Park name to align with sustainable project goals. The interviews gave some of the case study participants the opportunity to explain how the Waterway Park name came about and why they chose to use it. The first use of the Waterway Park name in the project came from the Lottery funded Milton Keynes Waterway Park work (Halcrow & BMKWT, 2006). Cecil explains why the choice was made:

“...we talked about it then not just being a waterway but a waterway park. And I found that using that four letter word at the end transformed it in my mind...calling it a waterway park suddenly conjured up a different image in my mind. So not only was it something for boaters and the traditional users of the towpath; the anglers, the cyclists and the walkers, but it was something that would bring green life and vitality within the developments, both existing and proposed, that it was going to pass through, and it really changed my outlook and philosophy [pause] it was amazing.” (Cecil, p.5)

Timothy goes on to describe how the Waterway Park name captured the design vision of the Lottery funded work at that time:

“So right at the outset the idea of the waterway was conceived to hit many targets at one and the same time. It’s not just about navigation, it’s also about physical activity and healthy living, it’s also about habitat and eco-system and greenery, and consequently the idea of the MK’s end was not that we are building a canal but we are building a Waterway Park.” (Timothy, p.3)

The choice of the Waterway Park name was a conscious decision, made to reflect the environmental and social benefits associated to their current design vision.

The choice of name for the project is obviously important and several of the interviewees are aware of making that choice. Along with championing the Waterway Park design vision, Chris actively discourages the use of the Canal name:

“...apologies for using the C word but people still use it, in fact it’s generally referred to in local communities as ‘the canal’ still and we work hard to try and correct that, because if it’s a canal we wouldn’t be particularly interested, because it’s just a bit of water between A and B” (Chris, p.6).

He is anti-Canal design vision and pro-Waterway Park design vision. Joe is another Waterway Park champion and explains his choice of name:

“So I use the words Waterway Park consciously as something that helps me explain the value of the waterway, but also I think it helps deliver the project, because I think if you talk about a canal you’re not going to interest a lot of people. The other reason I like to use the word Waterway Park is because for me personally I find that something I can justify putting my heart and soul into, because your suddenly talking about a huge user base for a facility like that, with a massive variety of benefits that come from it and the whole cost benefit equation stacks up when you talk about a Waterway Park.” (Joe, p.10)

In the ethnographic observations the naturally occurring language of the case study actors was identified as interesting and influential (see section 4.3.4). The interviewees have confirmed both how the Waterway Park name occurred and also their reasons for using it within the case study.

5.6.8 Participation

This group of themes relate to participation, one of the FT qualities. Other groupings discussed earlier, outside of the FT framework, have included reference to participation, such as those describing ‘Collaboration’ in the ‘Opportunities’ group.

Flexible Template: Participation group

Public engagement around waterway route (PR1)

Public engagement with outline waterway designs (PR2)

Political agenda to actor group engagement (PR3)

Lack of participation in design process (PR4)

Public participation seen as undesirable (PR5)

Organising participation of formal project actors (PR6)

Lack of public participation in project (PR7)

Gaining formal participation of expert actor groups (PR8)

The ethnographic observations identified a disparity between the aspirations of the Trust and what had been achieved to date. While many of the goals of the Trust reflect participatory activities within local communities, they are generally not backed by sufficient action to realise these aims. The most meaningful public participation currently within the project is through the volunteers (building the boat for example), and other participation through relationships with the experts and institutions who connect to large infrastructure projects. The interviewees gave a range of views on the subject of participation, both from within and from outside the core BMKW project groups.

Trust aspirations

The case for wider participation within the BMKW project was made by Timothy who identified that at the moment the project volunteers are generally boat users who are 'old white people', and that this doesn't even reflect the wider demographic of users on the current waterways engaged in other activities, such as fishing. Marion detailed the Trusts current efforts to engage with local communities and politicians, to win their support, presenting at public events, providing information to parish councils and grassroots publications and courting politicians at Trust information events. She described the Trust engagement process:

"...very important is local communities, because we need local communities to put pressure on their local councillors, to put pressure on their local authorities and the politicians to support the scheme. So it's basically keeping people on board, from the local communities all the way through to the leading politicians." (Marion, p.10)

Timothy describes the wider public engagement strategy of the Trust, of placing information in local media and organising public facing events to promote the waterway and allowing for

questions and discussion. An example of such an event, the Broughton Brook public meeting, was discussed in the Ethnographic chapter (see section 4.3.3).

Interviewees from the BMKW Trust recognised a need, and stated a desire, to generate more engagement and participation. Zack wanted to conduct more engagement activities with the local communities, so they would become supportive and influence the waterway. He recognised that formal engagement strategies were difficult because the route currently lacked the kind of design details which can provoke and support discussion.

Participation from the ground up and top down

Formal public engagement is required by local authorities' planning processes. This has come under criticism for offering a poor mechanism to gain true participation (Innes & Booher, 2004; Greenbaum & Loi, 2012), but stands out as one of the few public interactions regularly conducted. Joe identified that this was being carried out through the route side developments and did include the waterway within them. He stated that while they were valuable and had their place, more public participation could, and should, take place. Saffron also felt more needed to be done but recognised that how the project engages local communities, promotes enthusiasm and gives them a role was very tricky and not well understood. She asked, "How do we engage communities? How do we give them a role? but in a way that is not undermining the professionalism of the project" (Saffron, p.6).

Chris agreed that engagement was difficult and discussed how the Marston Vale Trust fostered public engagement and participation. They used their Forest Centre as a display space to present their messages, while favouring questionnaires sent through the mail to the local community to encourage participatory feedback from the local public. He criticised 'Q&A' events as only attracting the same faces every time. Chris commented that:

“...the vision that has been sold is of a Waterway Park with all of these broader benefits, I think that has the ability to engage communities far more effectively than merely building

a canal, which isn't particularly relevant to that many people locally or possibly nationally" (Chris, p.10).

He identified that it was the Green Infrastructure element that would provide the greatest potential for public participation.

External perceptions and expectations

The interviewees representing actor groups outside the Trust and Consortium raised different themes and issues around participation. The IDB is a conservative organisation that doesn't like change. This position is demonstrated by Mike's rejection of public participation in design:

"I suspect the public, you probably wouldn't want to get them involved in any detail in the design that is, really as with any development, it's usually the developer and his specialist consultants designing it and then seeking consultation, comment and consent from the regulating people..." (Mike, p.9)

This position is at odds with the commonly held views that increased public participation in design is beneficial (Arnstein, 1969), but can be seen to strengthen the IDB's authoritarian position by keeping decisions in the realm of expert actor groups.

O&H Properties are a major land owner and developer in the Marston Vale and as such are a powerful establishment actor group within the case study. However, Katie describes how O&H would like to engage in discussions and design activity for the waterway, but are not allowed to participate, "they [Consortium] have chosen to exclude land owners from that steering group and we don't really understand... we are obviously key to delivery" (Katie, p.1). This would seem to be at odds with the accepted and required role of developers in facilitating waterway construction within their future developments. As discussed in the Design theme grouping, O&H Properties are willing to include the waterway in their development plans and want to control the design across their land. Katie observes that, "if they [B&MK Trust] want that stretch of waterway then we are going to have to build something to deliver that, and the Trust always seemed to want to disassociate themselves from that, whereas that's the only scenario where it will bring it forward"

(Katie, p.3). She presents an explanation for this situation, “I think they feel that if they [Trust] bring us too closely into the loop they will lose the support of the politicians, and I think at the moment their priority has been to get it into the development plans... to keep the politicians on-board rather than talk to us about routes and delivery” (Katie, p.2). Katie sees the Trust making a pragmatic decision suited to the current stage in the BMKW project delivery timeline. The Trust has decided that their need to gain public and political support outweighs the disadvantages of excluding land owners from design talks. Chris also identifies the potential problem from the waterway being aligned too closely with land development:

“there is an issue that the waterway project I think needs to be mindful of which is the relationship it has with bringing forward development within the area and the opposition to additional development within the existing local communities. So at the same time they might support the concept of the waterway if the waterway is delivered on the back of additional major development people may prefer to have neither.” (Chris, p.7)

It is not overtly stated as a Trust policy but it can be seen that O&H Properties have such bad public relations in the Marston Vale, due to the previous EcoTowns proposal, that including them in design discussions would negatively affect the project’s public support. While the Trust’s rationale for this position is understandable it presents a tension with the policy of progressing the project through the encouragement of route side developments. This will need to be carefully addressed for the waterway to be delivered in the future.

The lack of interviewee’s discussion of participation and their focus on engagement can be seen to be indicative of the limited range of activities relating to participation. The BMKW project is still setting the foundations public participation through its focus on public engagement. While the participation of expert actor groups was seen in the ethnographic observations the comments of Katie and Mike would suggest that the Trust have some way to go in making it inclusive and balanced.

5.6.9 Situatedness

The Situatedness theme grouping has developed with few themes, which was more due to the researcher's developing understanding of Situatedness at the time of data analysis. This does not however mean that Situatedness was not present in the case study or interview discussions. Guy (2011) identifies Situatedness as "a frame to give shape to" the desirable fluidity in designs that allows design solutions to focus on "creating situationally specific solutions to locally defined challenges." We have seen many of the technical issues that need resolving around the route as 'locally defined problems' and that through the efforts of the case study actors' attempts are made to 'creating situationally specific solutions'. Taking this view, many elements that relate to Situatedness are found across the theme groupings already discussed but a number of separate instances are listed below.

Situatedness

Situating the waterway design in its locality (ST1)

Infrastructure as man-made system existing over long periods of time (ST2)

Waterway impacting its own regional context (ST3)

Future local communities invested in and care for waterway (ST4)

In his paper on designing fluid futures Guy (2011) goes on to give the example of Dutch architects responding to the demands of flood prevention by designing waterproof towns. Conversely it is the issue of flood prevention or water management where this case study neglects to demonstrate Situatedness. Both the ethnographic observations and Mike's interview comments identify that while the BMKW waterway route offers many 'local problems' only the IDB have defined them and the BMKW project has developed few 'situationally specific solutions'.

5.7 Key findings from the Interviews

The interview data has supported, and added detail to, many of the insights from the ethnographic data. This section identifies findings which have been provided by the interviews.

- The pragmatic focus on current challenges, through securing the route and ensuring development gain, was seen as a sensible focus of effort. Design work was not carried out for areas where future change was unclear, as this was judged a wasted effort that would become obsolete. This left the project without a well resolved design vision supported by visuals communications.
- The lack of design work providing a vision of the waterway in the future does not help to engage the wider public. Combined with the piecemeal approach to progress based on pockets of land where the BMKW route adjoins existing or planned developments, this has left scope for public cynicism towards the project to grow.
- The creation of isolated waterway sections through the pockets of progress that development gain provides was promoted as an opportunity to create linear ponds. The linear ponds concept was most notably promoted by those actors who supported the Waterway Park. They employed a pragmatic approach in their adoption of the linear ponds concept, seeing them as opportunities to develop Green Infrastructure and social inclusion benefits for the localised environment.
- Interviewees were generally receptive to route and design changes in response to emergent opportunities. This flexibility was seen by them as enabling openness to exploratory design activity in response to the future and the unknown changes it would bring. While this could be beneficial for future sustainable transitions, it can also be seen as a less progressive approach which leaves the overall project design without a positive direction.
- The BMKW Trust and Consortium, as formal actor groups supporting the project, were failing to provide the land developers an opportunity to be heard in design discussions. This was at odds to the current activity of looking for project delivery through development gain, which handed more power over the design of waterway sections to the land developers. The politics of certain Consortium members, especially the local authorities, was such that they could not endorse or guide developer activity. This

situation worked against land owners developing design proposals which were mutually beneficial for their developments and the BMKW project.

- The interviewees described a changing dynamic to the participation of actor groups in the project over its lifespan. Interviewees identified that while the project was currently focused on gaining political support, this was expected to eventually change to focus on community involvement in order to understand and manage local issues. Public participation in the design process was seen as worthy but a very difficult process to conduct effectively.
- Several of the interviewees supported the Waterway Park design vision and provided more descriptions of the vision and why they supported it. They claimed the Waterway Park to be more representative of the original spirit of the project and of the reasons why their organisations supported initial proposals. They listed the broader benefits offered by the non-water components of the Waterway Park linking them directly to sustainability through environmental and social aspects.
- A common justification for the project was provided through reference to the independent Economic Impact Assessment (SQW Consulting, 2009), which presented a supportive economic case for the BMKW. However, several interviewees identified that the balance between those who pay for the project and those who benefit from it meant the infrastructure was suitable for central government financing.

Combining Interview and Ethnographic Findings

Both the findings from the interview data and the findings from the ethnographic data (see section 4.5) inform an understanding of the BMKW case study. In order to develop the research interventions the combined ethnographic and interview findings are analysed against the FT qualities in section 6.3 of the following Interventions chapter.

6 Interventions

This chapter details phase 2 of the research, where I sought to participate in the case study project through carrying out interventions. Five sections make up the chapter, starting with a section detailing what interventions are in the context of this research. The second section combines the findings from earlier research, assessing them against the FT framework in order to inform the focus of the interventions. The third section draws from different literature to determine what form the interventions should take. The next section is the largest, detailing all the interventions carried out, showing results and analysing the data. The final section interprets the results of the intervention activities as a whole and makes observations and findings.

6.1 What are interventions?

Definitions are provided from Cambridge University Press (2016):

intervene (verb) - to intentionally become involved in a difficult situation in order to improve it or prevent it from getting worse

Intervention (noun) - the act or fact of becoming involved intentionally in a difficult situation.

Based on the above definition, and in the context of this research project, the interventions describe the researcher becoming intentionally involved in the BMKW infrastructure project in order to improve it. The focus of the research means the intentional involvement will take the form of influencing design activity in the case study, and that the difficult situation we aim to improve is the need for a future sustainable infrastructure.

The goals we want the interventions to achieve for the BMKW project:

- Improve the design work undertaken to deliver the BMKW project
- Promote understanding of how the BMKW project can become a more sustainable infrastructure

- Produce a domino effect from the interventions which has a wider effect across the BMKW project and over time.

The goals we want the interventions to achieve for the research:

- Understand how design activities can change the project in the short term.
- Influence the project activities in order to produce a more sustainable infrastructure.
- Assess the best way to prepare the project to take part in future sustainable transitions.

We need to understand what it is being addressed through the intervention, or in definition terms the difficult situation of the infrastructure project. To determine this we must look back at the findings from phase 1 and ask why do we need to intervene?

6.2 Combining Findings from Earlier Research

Data has been collected from the BMKW project through ethnographic observation and interview methods. Ethnographic research activities have observed actors and events, and identified important objects. This has provided a general overview and understanding of the project. Interviews have been conducted with key case study actors which have informed discussions and focused questions. From each of these activities a large amount of data was collected and analysed, and findings identified. The two data sets have tended to support and clarify each other's findings. The last two chapters have kept these methods and their data separate. These findings must now be analysed together in order to inform the focus, development and implementation of the intervention research activities.

Employing a funnelling approach to data analysis, this section distils ethnographic and interview data findings to the main salient points that inform the interventions. The Fluid Transitions (FT) framework (Guy, 2011) provides the theoretical lens through which the case study data is analysed. The FT framework identifies four qualities that it proposes need to be present for a design project to create an outcome that contributes to sustainable transitions. Figure 6.1 summarises the four FT qualities in a simple diagram which places the qualities in four quadrants.

The format and layout of this diagram is repeated through this section and the following chapters for ease of comparison and to aid understanding.

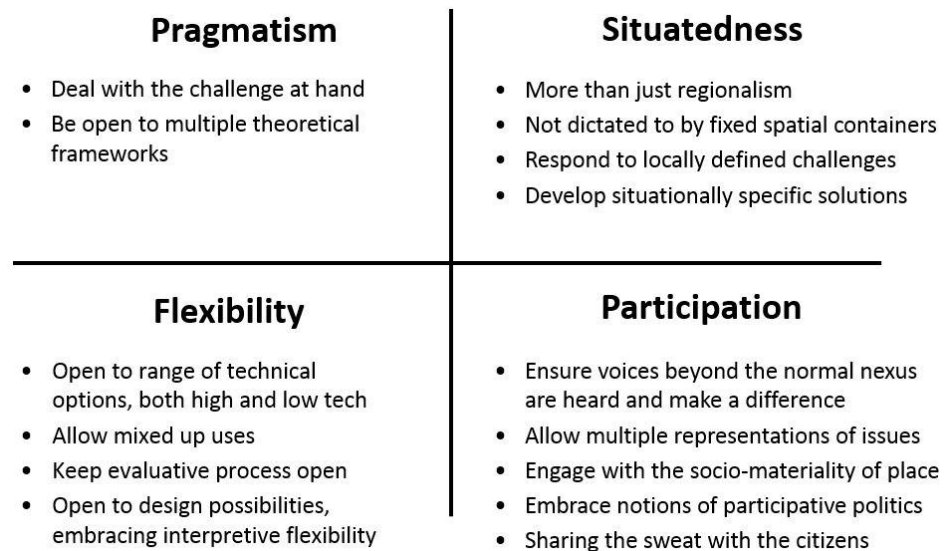


Fig. 6.1: The Fluid Transition qualities (Guy, 2011).

All findings from ethnographic and interview data were considered against the FT qualities. Consideration was given as to which quality each finding related to and how it might impact upon it. Then an assessment was made as to how that finding would influence the BMKW project to fulfil that quality in the manner Guy describes (2011). A diagram was created to record the assessment, again laying out the FT qualities in a quadrant displays and a short summary of how each finding was influencing a quality placed in the corresponding quadrant. Figure 6.2 shows this analysis of ethnographic and interview findings against FT qualities, and utilises icons to indicate the way in which each finding is influencing a quality. A green tick identifies a finding which supports a quality and a red cross identifies a finding which works against a quality.

<ul style="list-style-type: none"> ✗ Project management focus dominates decisions ✗ Theoretical reasoning was primarily functional & economic ✗ Progressing build through planning gain had given design power to land developers ✗ Community boat engaged a limited audience ✗ Future connection of linear ponds stores potential project barriers ✗ Dealing with the challenges at hand meant little design work carried out on future visions ✓ The current activities dealt with the challenges at hand: <ul style="list-style-type: none"> ✓ Securing the route / stopping blockages ✓ Community boat / volunteers needing meaningful tasks ✓ Building Linear Ponds / funding, timescale & developer incentives 	<ul style="list-style-type: none"> ✗ The A-Z sections had become dictating spatial containers ✗ Locally defined challenges represented by emergent routing and planning issues ✗ Design solutions for route side developments often side-lined the waterway within its locality ✓ The spatial containers of the A-Z sections reflected project specific issues ✓ Situationally specific solutions developed for challenges to routing and route side developments ✓ The Waterway Park design vision promoted a solution more situated in its environmental and social locality
Pragmatism	Situatedness
<ul style="list-style-type: none"> ✓ The differing design visions represented interpretive flexibility of actors regards the infrastructure as artefact ✓ Openness to range of technical options evident, whatever reasoned most appropriate ✓ Waterway Park promotes mixed up uses by introducing green infrastructure and social inclusion ✓ Partial sections interpreted as linear ponds ✗ Main infrastructure use promoted by project activity was water borne transport ✗ Canal design vision rejected high tech options ✗ Evaluative process led by economic impact assessment ✗ Maintaining design flexibility did not support the identification of desirable future visions 	<ul style="list-style-type: none"> ✓ Diverse range of actors present in case study ✓ Historical 'Peoples Choice' activity was a form of public participation used to down select routing options ✓ Actor groups used different project labels to represent their favoured design visions ✗ Design discourse was mediated through the A-Z object and primarily focused on technical issues ✗ Issues of socio materiality of the waterway were poorly captured in documents and rarely discussed in formal meetings ✗ Professional actors external to the Trust & Consortium had powerful influence over design communications ✗ The opinions of Trust volunteers often caused tensions with professionals ✗ The land developers voice was not being heard in design discussions ✗ Public participation in project activities was seen as a future issue
Flexibility	Participation

Fig. 6.2: Analysis of ethnographic and interview findings against FT qualities

In this assessment of the case study each FT quality is present under the influence of a set of findings. After the influence of individual findings was assessed it was necessary to consider the influence of the set of findings together for how they influenced a FT quality as a whole. The rest of this section summarises that aggregated assessment for each of the FT qualities in turn.

Pragmatism is much in evidence in the project, in both the focus of activities and the how they are being undertaken. The focus of everyday Trust and Consortium activities on satisfying project management needs and solving technical issues associated with securing the route are pragmatic, time dependent choices. Even the BMKW boat project, while not helping build the infrastructure, is a pragmatic choice to keep Trust volunteers engaged with an activity that generates wider public engagement and financial income. Using adjacent land developments to help build the waterway route achieves progress where it is possible at the moment. In combination this approach meets Guy's (2011) criteria to 'deal with the challenges at hand'. While the dominant design vision of the Waterway represents a pragmatic approach to meeting the requirements of delivering contemporary infrastructure.

Flexibility is also a quality well represented. The Trust allows the BMKW design detail and routing to change and distort in order to chase the opportunities that land developments adjacent to the route provide. Keeping the BMKW design free of detailed work that might change in the future definitely leaves the project open to design possibilities, a policy reinforced by having indicative dotted lines on the A-Z maps (BMKWC, 2014). Of particular note is the existence of multiple design visions for the project, a good example of what Guy (2011) identifies as interpretive flexibility.

Situatedness is evident, but only in a limited way. Where routing challenges and adjacent development occur these 'locally defined challenges' are quickly responded to with 'situationally specific solutions' which Guy (Ibid) identifies as preferable. Also the emergent Waterway Park design vision was promoting a design solution with the potential to be more situated in both its environmental and social context. However design discourse tended to lack representation of anything other than the geographically bound technical issues relevant to project management.

Whilst the A-Z (BMKWC, 2014) had become so dominant in design discourse that its definition of route landscape by sections dictated how space around the route was described and perceived.

Evidence of participation was very limited within the BMKW project. While a diverse range of actors were present in the case study they still represented what Guy (2011) identifies as the 'normal nexus'. The presence of different design visions meant that alternative representations of issues were present. However public involvement was very limited, beyond volunteering on the community boat. There was little opportunity to hear different voices in design discussions, and the representations of place were mostly limited to the project management issues captured in the A-Z (BMKWC, 2014).

Considered the FT qualities as a whole, and how they were found to be present in the BMKW project through the case study, some qualities were found to be more influential than others. Pragmatism and Flexibility were strongly in evidence, while Situatedness and Participation were less so. Guy (2011) does not specify one quality as more important than the other and it is assumed they are equally important. As such a balance between all four qualities is assumed to be the ideal, but is not the situation observed in the BMKW project. This status observed in the case study may not only represent a lack of certain qualities but also importantly an over concentration of other qualities.

Some of the implications of too much Pragmatism and Flexibility could be seen in the concentration of BMKW activities on securing the route and capturing development gain. The consequence of this approach being that power over the design process was handed over to the developers. Design work on the BMKW project was being conducted by professionals under the direction of the land developers, often with minimal communication with the Trust and Consortium. Whilst focusing on current tasks and being unwilling to design detail that would change in the future meant there was a lack of design work identifying desirable future visions for the infrastructure. Consequently the dominant design vision of the Waterway was not inspiring. All these factors contributed too many supporters of the BMKW project becoming frustrated with build progress and apathetic towards the design process.

The findings from this assessment are summarised in the diagram shown in Fig.6.3. The diagram again uses the same quadrant layout of the FT qualities. In each quadrant the main impacts upon that quality are bullet pointed in black. These main impacts are from the ethnographic and interview findings considered as a whole. Superimposed onto the quadrant diagram (in red) is a representation of the influence of the different FT qualities over the case study. A balance of influence would be represented by a rectangle, whilst here an isosceles trapezoid represents the current imbalance of influence. That is the BMKW project being found to have pragmatism and flexibility with dominant influence, and situatedness and participation submissiveive. In this way Fig.6.3 attempts to concisely summarise and communicate the content of the last seven paragraphs.

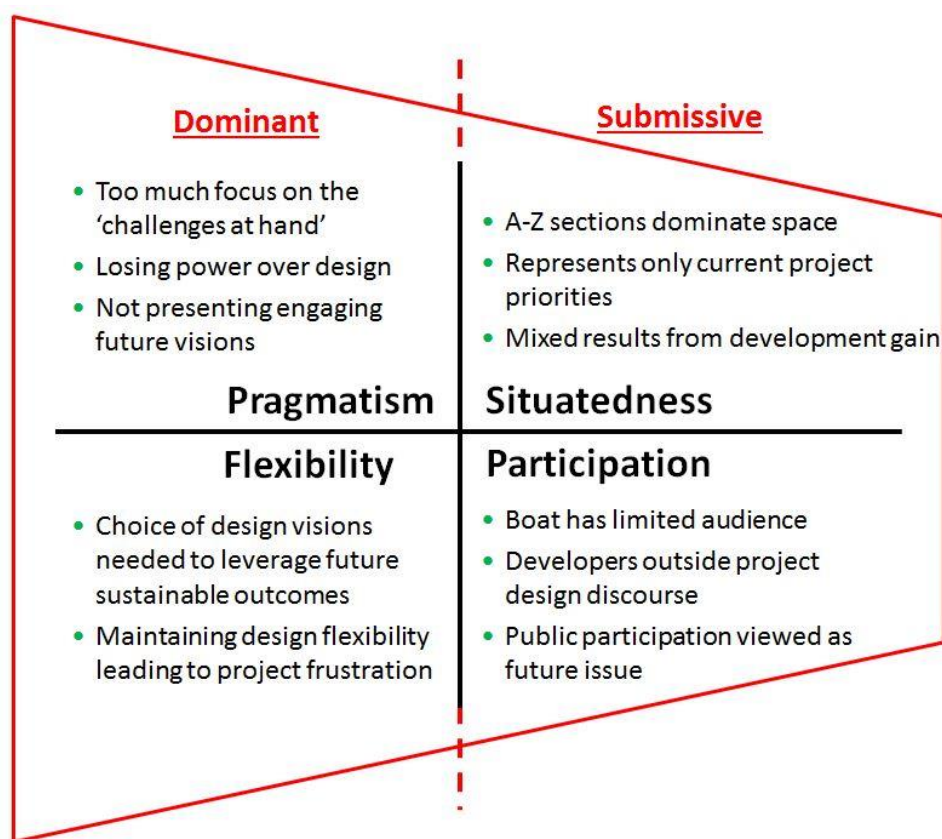


Fig. 6.3: Summary of status of each FT quality within the case study (black) and the balance of influence between all the qualities (red).

The FT framework was provided as recommendation for design projects which would enable them to find solutions to sustainability issues and contribute to wider sustainable transitions.

Through this assessment we can draw several more verdicts on the BMKW infrastructure project. At present the project has an imbalance of FT qualities, which suggests that if current design activities were to continue it would not provide a sustainable solution in the future. Previous historical activity suggests that the balance of qualities in the project has changed over time, which supports the assumption it would be able to change the balance again. The dominance of the influence of pragmatism and flexibility would suggest openness to change and influence, as long as a convincing argument can be presented.

6.3 Development of Interventions

In response to the analysis of ethnographic and interview data against the FT approach a strategy for the interventions was developed. This interventions strategy considered literature from design alongside literature from other relevant disciplines and incorporated insights from the case study.

The delivery of interventions is affected by a participant researcher taking a design approach. A design approach is highly suitable because it is a mix of creative and rational thought that is especially good at 'proposing additions to and changes to the human-made world' (Cross, 2001). In the context of the case study I am using what has become known as Design Thinking (Brown, 2009), in that it seeks to combine a human-centred approach to problem solving, with an iterative approach to the generation and implementation of solutions (in this study termed interventions), to imagine future scenarios, and do so working within a multi-disciplinary team through a process of co-creation (Kimbell, 2011). Design informed the interventions directly through literature on methodologies, reflective practice and design activities with particular disciplinary focus. For example graphic design knowledge/skills were employed to develop maps, design visuals and display boards. Also particular design thinking methods were selected for intervention activities (Curedale, 2013).

A key decision in the development of the interventions strategy was to focus on the development of the Waterway Park design vision. This decision originated from my 'being in' the project, through interviews, attending meetings and conducting observations. I had developed a deep

understanding of the case study and recognised the importance and potential of the design vision within the project. Specifically, the potential of the Waterway Park design vision to help address the imbalance in Fluid Transition qualities within the case study.

The choice of the Waterway Park design vision as the focus for interventions had sound reasoning as a response to the ethnographic/interview findings and their assessment through the FT analysis. Three design visions were identified in the project, of which the Waterway design vision was found to have a dominant influence, being a manifestation of the technical project management agenda. The Waterway Park design vision was found in the project, already present and being promoted by a supportive actor group. The actors from that group had aligned the vision with benefits that would improve the infrastructure's future sustainability. Sustainability was generally not understood or appreciated by case study actors. Supporting the Waterway Park design vision would leverage the main/only representation of sustainability issues in the project. It was a pragmatic choice to take an existing design vision, which already had some support within the project, identifying it as desirable, promoting it and helping case study actors develop it further. Taking this approach had the benefit of not introducing something new to the project and meeting resistance from actors as they reacted to change or what might be perceived as lecturing from an external expert. Instead the Waterway Park design vision would be recognised by case study actors as a creation of the BMKW project, giving the vision power and being perceived with veracity.

Design visions have been discussed in the Ethnographic chapter in section 4.3.4. Based on supporting literature about the use of design visions (Van Dijk, 2011; Dunne & Rabby, 2013); Porrit, 2013; Irwin et.al., 2015) one can construct an argument for the use of the Waterway Park design vision in the interventions. Developing the vision would help the case study actors imagine a possible future and create a space for discussions about the various alternatives that could be in the future. Because the participants are in effect telling themselves a story about the future it does not have to be constrained by the requirements of the present, so the dominant project management issues can be forgotten. Empirical data shows the Waterway Park design vision is

being promoted with sustainable benefits in mind, so there is even more reason to believe that it will support Irwin et al.'s (2015) proposal of visions being an important part of Transition Design.

The power of the addition of 'Park' to the label of the project was commented on by interviewees as having a powerful effect. This observation is also supported by literature, with Potteiger & Purinton (1998) suggesting that naming landscape is a fundamental strategy in developing a known place. Parks are known as green and pleasant places for beneficial and enjoyable recreation. Van Rooijen (2000) describes how open space has become an integral part of planning, of which the historical development of parks is a central part. He describes parks occurring as a reaction to the industrial cities and their resultant environmental issues. First as a pleasant area for the middle classes, then eventually as a place in which everyone could seek respite from overwhelming environmental conditions. Today the power of immersion in the natural environment that parks present, is recognised as a prescription for people's mental wellbeing.

On a practical and pragmatic level the Waterway Park design vision, as described by interviewees, is a new artefact that combines green infrastructure alongside the blue infrastructure of the waterway channel. This combination of infrastructure types provides opportunities to increase the social and environmental benefits of the BMKW project. The social benefits from the provision of amenities and activities will appeal to a wide range of users and provide environmental benefits through increased bio-diversity within a more attractive physical environment.

At a more abstract level the Waterway Park design vision allows the project to grow in scope, opening up the infrastructure into the surrounding spaces of the landscape and demanding that actors look at the full range of scales at which the infrastructure interacts with human activity. It also extends the temporal reach of the project as actors are asked to look into the future and imagine what could be. In this way the design vision has the potential to act as a vector for the introduction of sustainability issues onto the project agenda.

This focus of interventions around the Waterway Park design vision also addresses some of the issues identified by the FT qualities. Pragmatism and flexibility are represented in the dominance of the Waterway design vision, so by promoting an alternative vision with inherent sustainably benefits then their dominance should be combated. Situatedness could be addressed through the nature of the Waterway Park, which will be across multiple scales. At a large scale of the whole waterway route of blue infrastructure, down to a small scale as people take advantage of the places along the route where the Park offers them different levels of interaction.

Participation offers a greater challenge in the project. While literature would suggest that public participation through citizen control of the design process is the most desirable option (Arnstein, 1969) the major difficulties of achieving such a goal have been well documented (Innes & Booher, 2004; Greenbaum & Loi, 2012). Considering the stage of the project in its lifespan and the time constraints of the research, the levels of public participation proposed as desirable in the literature is a goal for later in the life of this infrastructure project. For the research interventions it was deemed most appropriate to aim to address participation issues of the key case study actors already involved. The interventions sought to increase the number of voices involved in the dialogue through introducing actor groups representing future user groups. It was also important to involve those struggling to make their voices heard, in particular land developers, who now had influence over the design of sections of the BMKW.

6.4 Implementation of Interventions

In implementing the interventions consideration was given to a range of case study factors. Participants were selected from key case study actors who had already taken part in interviews and with whom I had a professional relationship from ethnographic observation events. Participants were also sought from a range of actor groups who might best represent potential future users, such as cyclists, horse riders and anglers. The network of connections made within the case study provided contacts and introductions to appropriate user groups.

The logistics of the events involved considered and balanced choices. Events were chosen to be suitable for the task at hand, and held in less intimidating, neutral ground where possible. Scheduling of intervention events was a negotiation on participant availability. A maximum half day event was chosen as a balance between time availability and willing commitment on the part of the participants. This event length also allowed time for a limited number of focused activities and a good wrap up discussion.

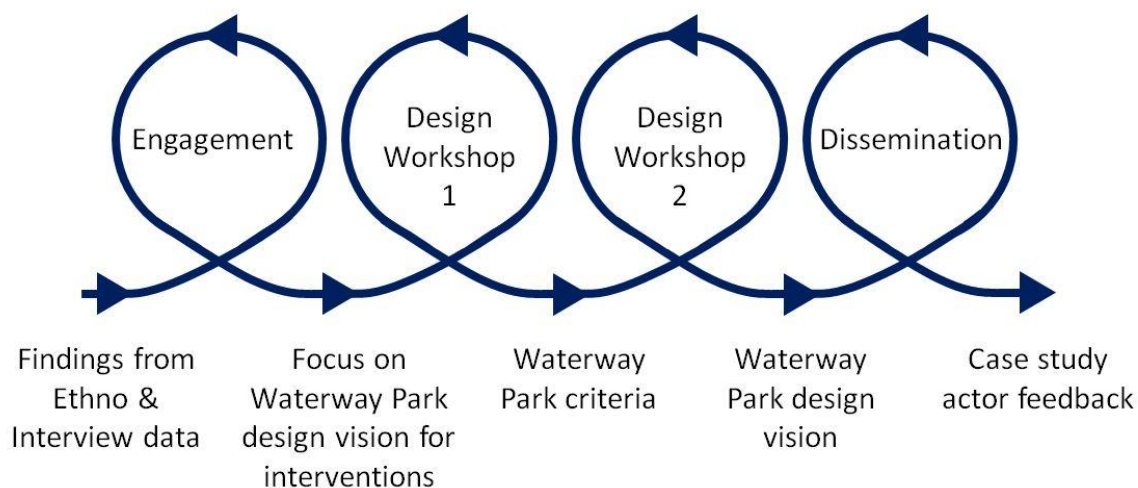


Fig. 6.4: Sequence of Interventions with output flow and reflective feedback loops.

It was decided to lead the participants, and the project, through a sequence of interventions. These would introduce the findings and suggested interventions, focus on building up the design vision through a process of co-creation with the case study actors and then feed that design vision back into the case study by passing it on to as many actors as possible. In the spirit of design thinking and action research the sequence of interventions would allow for reflective feedback from the participants, which would then inform the next intervention. This approach is outlined in the diagram in Figure 6.4.

The interventions are split into stages that focused on more specific goals, which were:

- Engagement Stage:
 - To communicate research insights gained through observation and to discuss these with an expert group to gain their feedback.

- To propose interventions based on the observations and insights from previous work.
- To get feedback from the expert group on the proposed interventions and their agreement to participate.
- Design Stage:
 - To foster case study design activities that will promote sustainable transitions.
 - To co-create a more sustainable design vision amongst project actors and supporters.
 - To examine how design activities can help create sustainable infrastructure
- Dissemination Stage:
 - To communicate the findings from the research to case study actors and allow them to provide feedback.
 - To promote a more sustainable design vision within the case study.
 - To influence the case study future design activity to promote sustainable transitions.

Table 6.1 provides a summary of the interventions, by stage and event. It includes the date of the event, the range of case study actors who participated and the range of activities that were undertaken. Each intervention is described in more detail in the sections that follow.

Table 6.1: Interventions details through Engagement, Design and Dissemination stages.

	Intervention Events	Date	Case study actors	Activities
Engagement Stage				
	Event – OU Research Update meeting	Dec. 2013	6 Attendees: Trust Directors & Consortium organisation representatives	Presentation Discussion (Approx. 3 hours total)
Design Stage				
	Workshop 1 –	May 2014	10 Attendees:	Introduction

Waterway Park		Trust Directors, Consortium organisation and user group representatives	Waterway Park Drawing Brainstorming Future News Article Discussion (Approx. 5 hours total)
Workshop 2 – Design Analysis	July 2014	8 Attendees: Trust Directors & Consortium organisation representatives	Introduction Design Analysis MK Waterway Park Marston Valley Housing Water Study Bedford Discussion (Approx. 4 hours total)
Dissemination Stage			
Event 1 – Consortium Meeting	Oct 2014	11 Attendees: Trust Directors & Consortium organisation representatives	Presentation Discussion (approx. 45 mins total)
Event 2 – Trust Annual Partnership Conference (APC)	Nov 2014	Approx. 100 Attendees: Trust directors, volunteers and members. Consortium representatives. Other case study actor group representatives. Invited guests, inc. MP with portfolio for Waterways.	Presentation Questions from Audience (approx. 25 mins total)

6.5 Engagement

Key actors from the BMK Trust and the consortium attended a meeting organised at the Open University in December 2014. The key purpose of the meeting was to present findings from the research to date and to propose future interventions in response to these findings. The primary

outcome of this meeting was to engage with key members of the project, to get their feedback on research findings and their agreement to participate in the next stage of the research.

The expert group attending this meeting all had a strategic overview of the project. They included four Trust directors and two senior managers from Consortium organisations:

- Cecil – Canal & River Trust (CRT) Senior Officer (Planning background)
- Chris – Marston Vale Trust (MVT) Senior Manager (Environmental background)
- Marion – Trust Director (Political and LA background)
- Liz – Trust Director (Civil engineering and LA background)
- Barry – Trust Director (Project Management background)
- Tim – Trust Director (planning and LA background)

Event focus and outcomes:

The event was an informal and friendly affair, as all attendees knew each other and had participated in the research previously. Research findings thus far were presented to the attendees through a PowerPoint presentation. Attendees were encouraged to interrupt the presentation with any questions they saw fit. Afterwards there was ample time for discussion and to reach an agreement on the way forward. In total the engagement event lasted just short of three hours. An audio recording was made of the full meeting, along with ethnographic journal notes capturing my reflections upon the meeting post event.

This event provided the first formal opportunity to present to case study actors and research participants on the observations and insights from the research activities to date. The subject matter was not as detailed as the research findings on ethnographic and interview data provided in earlier chapters. This was partly due to the maturity of the case study research but also to make the content suitable for the audience. The presentation focused on language use found in the case study, the approaches being adopted to address difficult issues, the mediating objects created in the case study, and the current visions for a future waterway. The presentation concentrated on the practical relevance of these issues to the case study and proposed a

legitimate focus for the project around the vision of the Waterway Park. The academic aspects of the research, including theory used, were lightly covered to keep the audience engaged and not confuse discussion on the way forward.

Attendees recognised the different names used for the BMKW project and the different visions of a future infrastructure that they suggested. There was a broad consensus that the Waterway Park name was useful, identifying that it would appeal to a wider range of potential future users and that it was appropriate, considering that the route already ran through parkland in several places. At this point the participants were looking at the Park part of the name in the most literal sense.

Discussion regarding the difficult issue of water management focused on the tensions between the project concept and the Internal Drainage Board (IDB). Trust directors described how at initial waterway meetings the IDB were “very polite, but very negative”, and that they were “going to be buggers to deal with”. Chris and Cecil countered this view, stating that while the IDB was conservative and reluctant to engage with change, the tensions with them were not insurmountable. Chris suggested that “a more holistic approach to design” had a role to play in persuading the IDB to embrace new solutions, especially those that provided the broader benefits of the Waterway Park. Attendees agreed that with the implementation of the European Union (EU) Water Framework Directive (WFD), the power and tactical significance of the IDB would increase in future due to new legislation and policy. Therefore it would be important to find constructive ways to work with this group in exploring a broader view of the project in terms of the Waterway Park vision.

An existing key design object, The A-Z Project Plan (BMKWC, 2012), was discussed as a powerful object within the case study. Attendees accepted that the A-Z, while a valuable form of communication had a narrow focus, centred on a project management agenda. Trust directors added their own appraisal of its failings, particularly the lack of certain technical details and ability to drive the project forward. Discussion followed on how best to communicate to more diverse audiences in general. Chris observed that the A-Z presently didn’t support the delivery of an infrastructure that matched the original vision sold to partner organisations. Cecil then suggested

that it might best suit the project to create a sister document to capture illustrations, artists visions and photos of exemplary places which would support a Waterway Park vision. The nature of such a new document was discussed, and what might go in it.

A Waterway of Parks



- Promote identification of waterway parks and develop their character
- Create engaging future visions to promote wider discussion

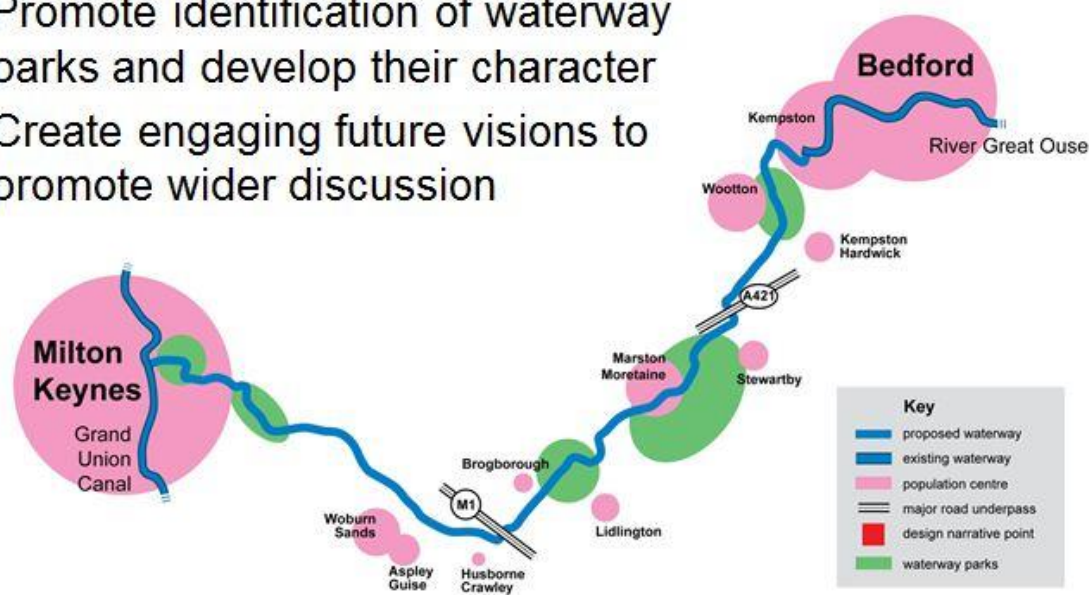


Fig. 6.5: Engagement presentation slide promoting focus on the Waterway Park design vision.

Post presentation discussion initially focused on the semantics of the Waterway Park label and if the plural Waterway Parks was more appropriate. Attendees requested to refer back to a diagram from the presentation, shown in figure 6.5, which they referred to as the 'green blobs' diagram. The diagram proved particularly helpful in stimulating discussion around the Waterway Park design vision. Some attendees saw the infrastructure as a series of Waterway Parks linked together by the blue infrastructure, others as one linear Waterway Park which varied in size depending on its surroundings. It was agreed that this issue shouldn't distract their support and could be resolved within the workshops.

Attendees focused on the indications from the FT approach that participation in design activities needed to be enhanced, asking if the need for 'other voices to be heard' meant opening discussion with the wider public. There was agreement that this issue was project timescale

dependent and that presently a broader range of participants who could offer differing viewpoints than boaters would be beneficial to discussions about the project and its future scope. Attendees provided suggestions for workshop participants from their existing network of contacts that resulted in an open discussion regarding tactical invitees to achieve broad engagement and foster the maximum impact from workshop activities and discussions. It was concluded that workshop participants should be invited from the Waterway Partnership, a Canal & River Trust sub-group involved in nationwide governance issues comprising of actors from diverse backgrounds.

Increasing participation was seen as a way to gain positive impact from workshops. Tim suggested,

“...we might get otherwise cynical partners to help define something that is much more attractive than if they realised they were going to have to build it... use that gathered constituency to in effect strengthen the case for an imaginative park that does the linking in and the wider impact which is unstated at the moment”.

It was suggested that the workshops should include some of the less engaged Consortium organisations who through their participation might start to become more agreeable and move towards supporting the project.

The event finished with attendees praising the research thus far and offering thanks for its contribution to the waterway project, adding that the meeting had not only helped communicate key findings from the research but also communication between themselves as a project group. Several attendees expressed interest in the FT literature, and a copy of the paper and event presentation was circulated to attendees after the event.

6.5.6 Analysis of the Engagement Event

There was general broad agreement from attendees on the research findings presented, and the courses of action outlined. They saw worth in the focus of the design interventions and how this might influence case study design activity. The support for the Waterway Park name and design

vision it outlined was substantiated by the enthusiastic discussion that followed. This discussion did identify that the initial understanding of the Waterway Park was through the word 'Park'. The attendees focused on the literal association to 'Park' with green grass and trees, and started to reason where on the projects route it would pass through suitable areas and thus be a park. The Marston Vale Trust manager is a key Waterway Park promoter and this event provided him the platform to speak directly to other influential case study actors, promoting the design vision and identifying appropriate actions. For example in his description of the benefits of a Waterway Park, he identified it could also provide benefits for water management and in doing so help placate a difficult partner.

Participants recognised that only the Waterway design vision was being supported in the case study, and that the main vehicle for its promotion was the A-Z guide (BMKWC, 2012). They suggested to address this issue through the creation of a 'sister document', proposed to capture the Waterway Park design vision. Choosing to label the object as 'sister' implies an interesting status issue. They are part of the same family, while maybe the 'sister' is interested in the softer issues of the project?

The 'green blobs' diagram, shown in figure 6.5, proved very useful in stimulating discussion. The utility of this simple diagram further demonstrated the necessity of stimulating visual communication to engage an audience in a design proposition. I resolved to develop this diagram further for the next interventions.

More participation was accepted as desirable within the case study project, while being acknowledged as difficult. The willingness to suggest other participants from the Waterway Partnership group was helpful to organising the next intervention. This could also have been a way for the project to manage the difficult issue of participation, by choice editing who the 'public' are. This would allow them to select a known entity that individuals and organisations approved of, and who would not introduce too much conflict into the participation process. It was also telling that the attendees identified the involvement of members of their own Consortium actor group as potentially benefiting from improved participation.

Engagement Stage Outcomes

- Agreement with the previous research findings and support for the proposed interventions.
- Attendees had a literal understanding of a Waterway Park that linked to the word Park and therefore only associated it geographically with areas of green grass and trees.
- Proposal for a 'sister document' to compliment the A-Z. This new object would capture the Waterway Park design vision by pulling together supporting material (illustrations, diagrams and photos).
- Identification by members of the Trust and Consortium that these core actor groups would benefit from improved participation.

6.6 Design Interventions

The support of the project expert group for the vision of a Waterway Park provides a firm foundation for engaging workshops with a broader range of participants. The rationale for a 'design intervention' at this point in the research is described in section 6.3. The key things that make the workshops a 'design intervention' include:

1. The use of design activities to instigate change in the case study project
2. Focus on addressing the problem of making the future infrastructure more sustainable.

The design activities within the workshop are intended to reframe the design vision for the project as it journeys through its timeline (see figure 4.2). Reframing the design vision of the project towards the Waterway Park is an important focus in this stage of the research. The current dominance of the Waterway design vision means there is a focus on technical project management issues. The design interventions must promote the Waterway Park design vision whilst maintaining the benefits to the BMKW project the Waterway design vision has provided. The goals of these design-focused workshops are to:

- foster case study design activities that will promote sustainable transitions.
- co-create a more sustainable design vision amongst project actors and supporters.
- examine how design activities can help create sustainable infrastructure

6.6.1 Workshop 1 : Exploring the Waterway Park

The first workshop was held in a large meeting room at the Marston Forest Centre. This was selected as it was situated right next to an uncontroversial part of the waterway route and had not been used as a regular project meeting venue so could be considered neutral ground. The aims of the workshop were to:

- strengthen the Waterway Park vision within the project.
- co-create a Waterway Park design vision.
- analyse how a design approach can stimulate a process of sustainable transition.
- gain engagement of case study actors for the subsequent workshop.

Of the ten attendees six were previous research participants, while Fred and George were new to the project. Darren and Miguel were fellow OU students helping to facilitate the workshop, take notes on proceedings and participate as active cyclists in the MK area. Participants included:

- Marion – Trust Director (Political and LA background)
- Tim – Trust Director (planning and LA background)
- Liz – Trust Director (Civil engineering and LA background)
- Joe – Bedford LA senior officer (economics background)
- Chris – MVT senior manager (environmental background)
- Saffron – Cen Beds LA senior Officer Green Infrastructure (Environmental background)
- Fred - Cen Beds LA senior Officer (Planning background & new to the project)
- George – Local Angling Group (Treasurer of group & new to project)
- Darren – OU PhD student (Keen Cyclist, helping facilitate workshop)
- Miguel – OU PhD student (Keen Cyclist, helping facilitate workshop)

Workshop Introduction

The workshop was facilitated by myself, aided by two OU peers. This was a morning event that began with a short presentation about the research, the workshop aims and the activities focused

around the Waterway Park. The 'green blobs' diagram (see figure 6.5) was used again to emphasise the points along the waterway route with the greatest potential as Waterway Parks. After the presentation and before the workshop activities commenced, participants introduced themselves to each other as four were new to the BMKW project.

Activity 1: Waterway Park drawings

Participants were supplied with an A3 sheet of paper and set of coloured marker pens. The paper showed a basic sketch of the cross section of an open aspect waterway (figure 6.6, lower image). They were asked the question: *What is a Waterway Park?* Then asked to draw on the paper what they thought should also be there to make a Waterway Park.

This activity aimed to:

- Engage participants with something fun and outside their normal activities, i.e. drawing.
- Get the participants thinking about what makes a Waterway Park, instead of just a waterway channel.
- Challenge case study actors to re-assess the applicability of generic waterway designs provided by the Developers Guide (BMKWC, 2013).

Activity Theory:

This activity focused on asking participants to think creatively in generating a design for a Waterway park. Literature on creativity suggests that the activity of drawing - the act of making marks – helps thinking creatively and in the generation of ideas. This activity would be something different to wake everyone up in the morning, challenging them to do something different and stimulate the flow of ideas that the next activity could capitalise on.

The earlier research had identified that the Waterway design vision was concentrating efforts on the functional blue infrastructure, the slim portion of land that would hold the blue conduit and its towpath. The Waterway Park vision was more than just the blue infrastructure and included

the green infrastructure that surrounds it. Activity 1 aimed to establish what the broader aspects of the Waterway Park could include in its vision.

The Developers Guide (BMKWC, 2013) provided the basis for the basic cross section onto which the participants would add their drawings. The Developers Guide, discussed in section 4.3.3, was developed to inform and encourage developers to deliver improved sections of waterway through the development gain process. However the guide had been observed as providing a minimum set of requirements for a waterway. The Guide uses the diagram shown in figure 6.6 (upper image) to show a section of an open aspect waterway, the closest it comes to describing a Waterway Park. This activity takes the Guide diagram as the basis for the blank cross section. This act was intended to point out the potential of the Developers Guide to promote a more progressive vision of the waterway to the developers.

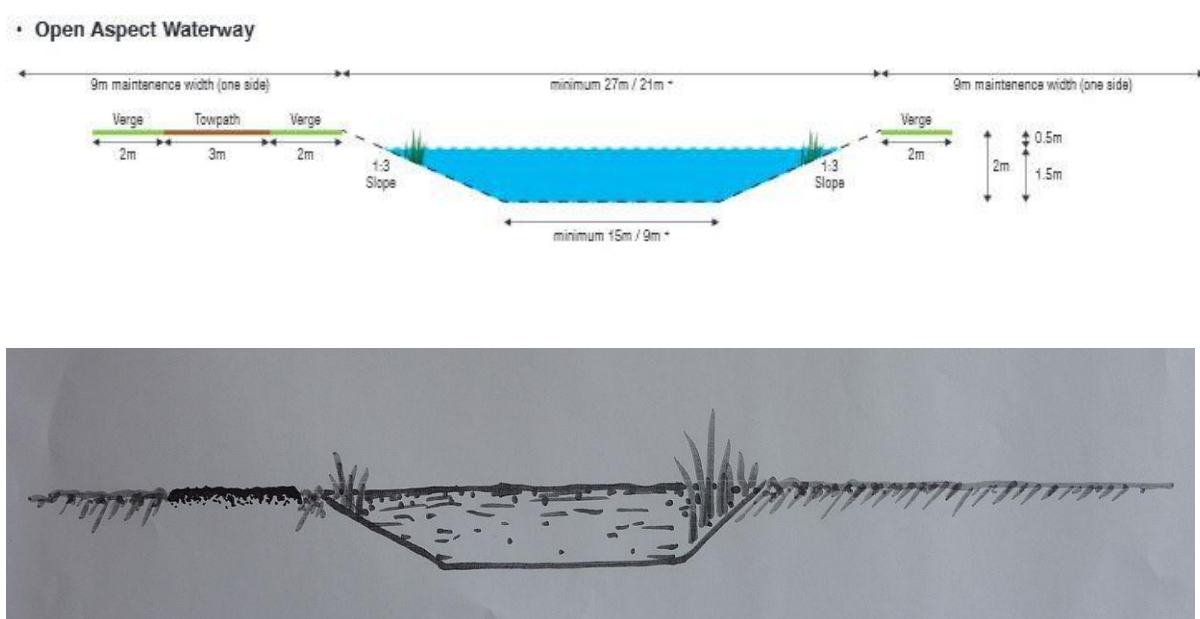


Fig. 6.6: Detail from Developers Guide of waterway cross section (top), and detail of blank Waterway Park drawing sheet (bottom)

Activity Outcomes:

This activity was generally well received by the participants, and after some encouragement most participants took the plunge, becoming engrossed in mark making. A few of them didn't want to draw, and made written lists around the central drawing, which still served to generate ideas for

the next activity. One participant did not engage with the task, writing few words and then waiting for the next activity. This participant's conflicting presence in the workshop shall be discussed in the workshop analysis.

The source for the simple waterway section diagram was not made explicit. Even so several of the participants who were involved in the creation of the Developers Guide recognised its origins. In impromptu conversation through the workshop one of these key case study actors acknowledged that the Developers Guide could benefit from incorporating some of the Waterway Design elements we were discussing, and that at present it represented only the blue infrastructure.

The Waterway Park drawings created were of many styles, covering a range of different features. Some examples of the drawings generated are shown in figure 6.7.

Approximately 75 per cent of the drawings related to the feature external to the blue infrastructure of the waterway itself. Instead they described the features and benefits associated mainly with the Green Infrastructure that is associated with the 'Park'. Social and economic aspects were included, so the Waterway Parks presented generally looked like happy places where people spent their recreation time. At the end of the drawing activity participants were keen to discuss the drawings they had created. Each participant was asked to read out a few of the most important things they had drawn. A list was created and quickly 40 different criteria for a Waterway Park were identified. These points were collated on a flipchart which naturally led into workshop activity 2.

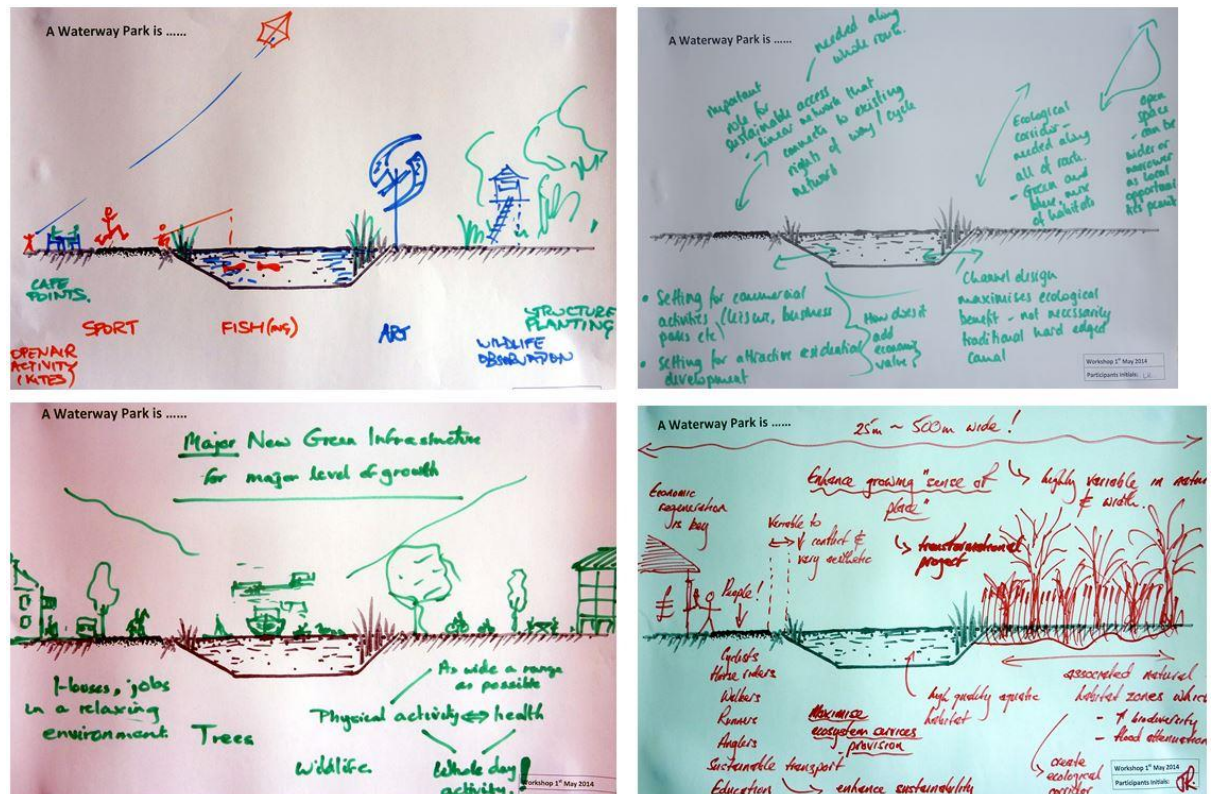


Fig.6.7: Selection of Waterway Park drawings by workshop participants.

Activity 2: Brainstorming Waterway Park Criteria

Activity Aims:

- To capture elements that would be present in a Waterway Park
- To co-create a shared Waterway Park design vision

Activity Description:

The participants were split into two groups that represented a spread of actor groups. The groups were asked: "What are the elements that make a Waterway Park? These elements could include what is there, how it is being used, who is involved. We are trying to identify the essence of what a Waterway Park is." Discussion of the drawing activity had created a flip chart list of features and benefits. Participants were advised to further reflect on these elements from the drawing activity as a stimulus for ideas.

Participants were split into two groups, A & B, each with a representative split of organisations and individual experience. Each group was given marker pens and post it notes. They were

encouraged to follow the four brainstorming rules (see below), write as many ideas as they could think of on post-its and cluster them together. An OU facilitator sat with each group to assist and take notes.

Activity Theory:

Brainstorming (Henry, 2009; Osborn, 1963) is a creative technique used to explore and generate ideas at the early stage of projects. Brainstorming generally employs four practical rules:

- No criticism, in order to create the right atmosphere and defer judgement.
- Freewheel, with the uninhibited expression of whatever ideas come to mind.
- Go for quantity, as the more ideas recorded the greater chance of success.
- Hitch-hike, to build on other ideas and enhance group interaction.

Brainstorming Waterway Park elements in this way captured all the data generated in physical form, making the future analysis process easier. The elements were co-created by a diverse group of actors, which captured more viewpoints on what a Waterway Park design vision should be.

Activity Outputs:

Each group produced different outputs. Group A provided detailed elements described in a sentence. They worked together through discussion, with one participant self-elected to write down the elements and facilitate the others. Group B detailed elements with short statements or single words. They struggled to follow the activity guidelines, with the reluctant participant mentioned previously leading others off topic. An OU facilitator intervened and guided them through the process, writing down elements that were discussed.

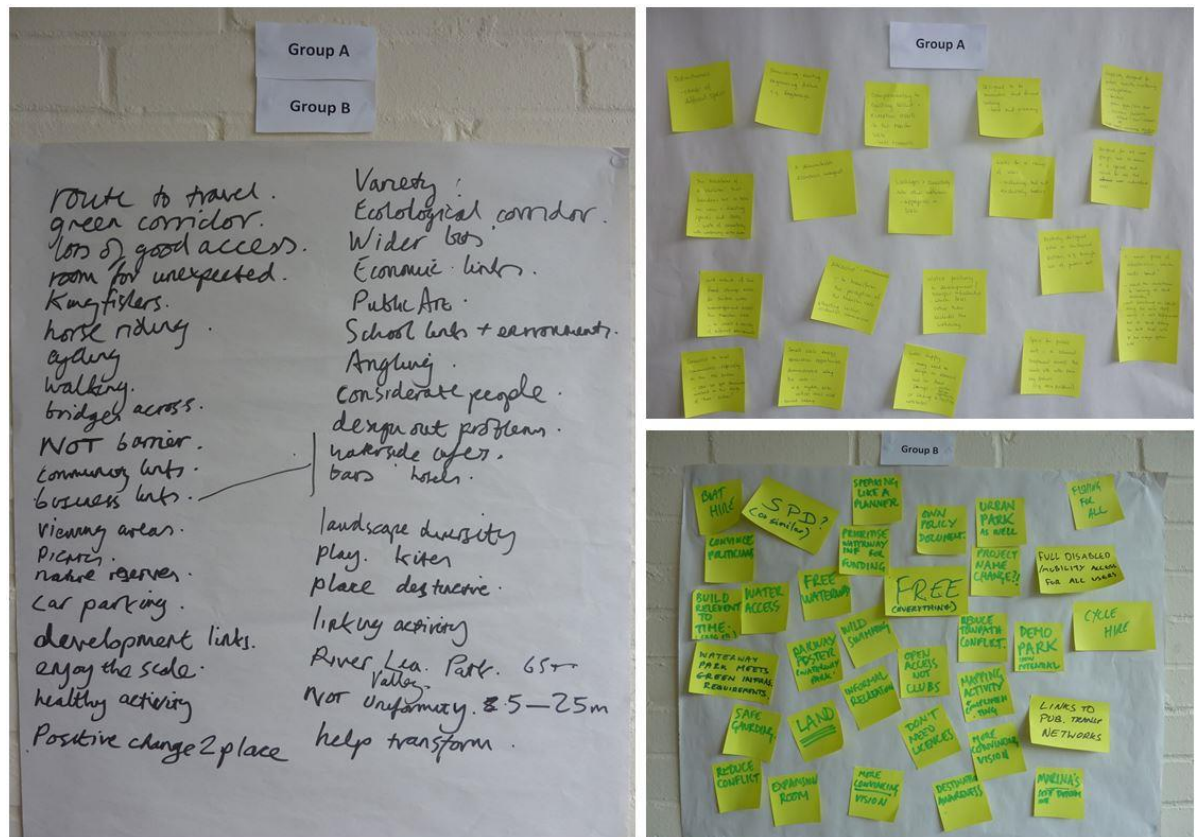


Fig. 6.8: The results of the brainstorming exercise, inc. initial workshop discussion (LH), group A post-it notes (Mid.), and Group B post-it notes (RH)

The brainstorming activity identified 89 separate elements of a Waterway Park. The physical outputs of flipchart list and post-it notes is shown in Fig. 6.8. A full listing of these elements is presented in Appendix F. The elements are discussed in more detail in the analysis of this workshop as a whole at the end of this section.

Activity 3: Future vision – 2050 news article

Activity Aims:

- To develop an engaging vision of the future and a completed Waterway Park.
- To communicate that future vision to in the form of a news story.
- To co-create a shared Waterway Park design vision

Activity Description:

The participants were informed they were to play the role of journalists in the year 2050. They had just visited the newly opened B&MK Waterway Park and had to write a news article about their experiences. They were asked questions to stimulate the group conversation:

- What was happening?
- What did you see?
- Who did you meet?
- What did you do?
- How did it feel?

One of the participants in each group was given a marker pen and asked to build up a map of the story on flip chart paper, collating everyone's ideas. They were assured that the key narrative was most important, and they shouldn't worry about the detail of the grammar or text. They were given about forty minutes to complete the task, and then one participant from each group was asked to present the news story to everyone. These presentations were audio recorded and later transcribed for analysis.

Activity Theory:

The news article activity relates to Backcasting methodology (Curedale, 2013). In Backcasting goals are identified, along with desirable future scenarios that achieve them, then the steps identified which are needed to reach the goals. It was hoped that the news articles would provide case study actors with future scenarios, and stimulate their own Backcasting post-workshop. The use of Visioning to promote Transition Design is promoted by Irwin et al. (2015) as a way to imagine a possible future and the various desirable alternatives that could exist. Both literatures agree that by telling a story about a future it does not have to be constrained by today's requirements. Bringing together case study actors to share each other's personal visions allows them all to share a part in the co-creation shared visions of the Waterway Park.

Activity Outputs:

The following text boxes present the future news article stories that the groups presented at the workshop. The news story texts presented here are taken from audio recordings of the workshop. They are edits of the full transcripts, made to more clearly and concisely communicate the stories.

Group A News Story - Communities Unite for Royal Grand Opening of Waterway Park

This year, 2050, sees the Grand Opening of the Bedford & Milton Keynes Waterway Park, a project 66 years in the making. The Waterway Park is estimated to have cost £100 million and the launch event funded by the EU Dept. for Cultural Growth to the tune of £1 million pounds.

A Royal Grand Opening will take place at the Brogborough Lift in the Marston Vale, now 40% forest and home to the Waterway Park, its main artery of regeneration. The Brogborough Lift is a major piece of civil engineering, the final point of integration for the Waterway Park. The opening will be conducted by Prince George and Princess Charlotte, travelling from either end of the Park by royal barge. The Royal progress will stop at communities along the route to hear stories of their involvement. The Royals will finally meet up for the inaugural sluicing event, the opening and closing of the Brogborough Lift and officially opening the Waterway Park.

The opening will be accompanied by the Great Connection where people and communities converge to join the celebration. Cyclists, runners and boaters will be travelling in parallel to meet the royals at the opening event. We will also hear from the few heroic people joining the two Waterway Park ends by travelling around the world in different craft, pedal- and motor-powered journeys concluding at Brogborough. All events are being broadcast live to cousin projects, twenty major infrastructure projects around the world whose communities have collaborated for the last twenty years. Once opened the party will continue with a Waterway Park Cultural Festival, starting with a high profile concert at the new 25000 capacity Brogborough Lift venue. The Festival is a year-long celebration of contemporary arts across the region at venues big and small, with a target of two million attendees.

While these grand events celebrate the Waterway Park opening it is important to remember the impact the Park has had so far. Much has been made of the new low carbon, technology and tourism industries bringing economic growth to the area. There are other lesser known stories, such as the Smiths of Stewartby, a family living in the area since the brick works era. Their hereditary health issues have cleared thanks to the Waterway Parks nourishing regenerative environment. And the story of the Chinese water deer, a non-indigenous species whose population has thrived in the Park after escaping a nearby game park. In a counter-intuitive twist the area's growing number of Chinese restaurants now specialise in humanely-culled water deer venison dishes.

The real story of the Waterway Park is one of the communities who created it. The whole project has been measured in 'communes', the new unit of volunteer days. Now when the Royals ask "How much has this cost?" one of the many Waterway Park volunteers can answer 100 million communes.

The two articles were very different, in the way they described the Waterway Park, in how they presented the infrastructure in this future time and the issues that they focused on around that story. Group A's article focused on the infrastructure as a grand legacy of their efforts and how the completed Waterway Park was celebrated. They talked about: politics; organisations; large

scale overview or project; whole systems; linking to other infrastructure and transport methods; celebrations and the arts. Group B's article was at a human scale, describing the reporter's personal interactions and experiences with the Waterway Park. They talked about: the human scale; life experiences; daily activities and human interactions. These differences are indicative of the varied scales across which that infrastructure exists, from a human to national scale. Having knowledge of the case study and its actors means I can identify the personalities of the two participants in the stories that were created. Speaker A was articulate, expansive and inclusive. Speaker B was considered, focused and personal.

Group B's presenter reflected upon their article,

"Ours is probably a small column in the paper, a blog article, or a little countryside diary item. Well, it was based in part on a discussion about a Kingfisher we had right at the beginning of this morning, and in part because it is a nice combination of green and blue, which reflects what the waterway park is about."

Group B News Story - A Flash of Turquoise

"Wow, what was that!?"

Words from a small group of children as they spot a kingfisher diving into the waterway, then swim towards the bank to get back on their push bikes. They were meeting up later with their granddad who was fishing, having used his phone app to find out the best place to be.

An electric bike whispered by looking to plug-in at the forest centre. She was a commuter from the on-route garden village.

I had alighted from the train from Cambridge at the Brogbrough Experience, and spotted a Center Parcs excursion group embarking on a water taxi to the forest centre, heralded by its cluster of wind turbines. I was now half way through my week's holiday partaking in the many diversionary activities along the route, with my luggage already forwarded to the next night accommodation. I was impressed by the extensive mature woodland and wildflower surrounds. It was difficult to imagine the clay digging, brick making and chimney-filled history of the area.

These stories are analysed further as part of the whole workshop analysis in the following section.

Following the news story activity the workshop had a wrap up discussion. Most participants stayed on and engaged in the discussion, with many interesting points being raised about the

design vision and its potential. The points raised in the discussion have been included in the following workshop analysis.

Workshop Analysis

After the engagement event I had attempted to gain more voices at the workshop, following up on the contacts supplied to me. Many new people were invited from different user groups, departments at LA's and a disengaged Consortium actor group, the MK Parks Trust. However, only two new voices were heard at the workshop, the representative of a local anglers group and the other a new LA officer with a new job, of which the BMKW project was part. The two OU peers I don't include as they participated predominantly in an observer role.

Along with the difficulty of acquiring wider participation there is also the issue of what kind of participation you get. One of the participants from the Trust became a disruptive influence in the workshop, introducing conflict into the proceedings. He was a long time senior volunteer and had been with the project from near the start. It might have been he took offence at one of my critical observations of the Trust's activities in the introductory presentation, or he could just have been having a bad day. Either way activities were knocked off course as he disregarded instructions or happily held forth on project history taking other participant's attentions with him. The relevant point here is that participation literature (Arnstein, 1969) demands wide inclusive audiences, but conflict and resistance can occur naturally. Reaching consensus during participative workshops can be rare.

Participation was also a theme that appeared in the workshop, in both the news articles and the wrap up discussion. In the workshop discussion Trust actors recognised that the Waterway Park design vision offered them a way of engaging with local communities and that maybe that was a better focus of efforts for the present than focusing in engineering solutions, considering the stage of the project build. Group A's news article described how the project had participated with other similar 'heroic' projects at an international level. Other workshop activity and discussion points linked into participation, as you will see in the following paragraphs.

After conducting the day's activities and engaging in the discussion many of the discussions started to link to the FT quality of Situatedness. Through showing the participants the Waterway Park 'green blobs' diagram and getting them to draw around the blue infrastructure, they naturally started to think about the spaces and places around the waterway. This was probably responsible for stimulating the repeated raising the issue of participation with the local communities. Instead of the waterway route passing them by, the waterway park was opening up into the surrounding space around it and physically moving into the local communities' areas of everyday life. In the conversation and drawings a Waterway Park was most often envisaged as green, wooded classic parkland. However one of the participants voiced a wider potential for the Waterway Park by suggesting there could be 'a palette of options', in brown and grey which would involve urban and intermediary environments. Situatedness was also evident in the way the design vision helped participants traverse through the different levels and scales that the project worked on. The news stories travelled across many levels, from international collaboration, to linking transport infrastructure, to cycling along the towpath, to kingfishers and Chinese water deer thriving in the bio-diverse environment the Park created.

The FT quality of Pragmatism was also in evidence through the responses of the case study actors to the opportunities that a Waterway Park could offer. They recognised its potential as an engaging vision of the project which could influence a large audience: local communities, politicians, council officers and the Consortium. Also the Waterway Park was made up of both blue and green infrastructure (GI) this could open up funding opportunities for the whole project on the back of the GI portion. Finally the Waterway Park criteria identified through the first two activities was seen as having potential to develop into a design code, which could be supported by LA policy. This could give leverage to the Trust in their dealing with developers in order to influence the designs they created in favour of the infrastructure project's benefit.

The FT quality of Flexibility could be seen to be evident in the way nearly all the participants embraced the Waterway Park design vision and contributed to the design vision and criteria. This

required the participants to consider a different interpretation of the infrastructure project than the dominant Waterway design vision presented in the project.

Through the workshop there was again a call for more visual images to communicate the Waterway Park design vision, with the suggestion of persuasive illustrations in the style of historical railway tourist posters. This was something which had potential to appeal to both the supporters of the Canal and Waterway Park design visions. Whilst this discussion about visual communications was positive for the Waterway Park design vision it did reflect a couple of difficult project issues. A lack of understating of the range of visual communications materials that had been produced throughout the history of the BMKW project and the dominance of the A-Z (BMKWC, 2012) as the default visual aid to all design discourse.

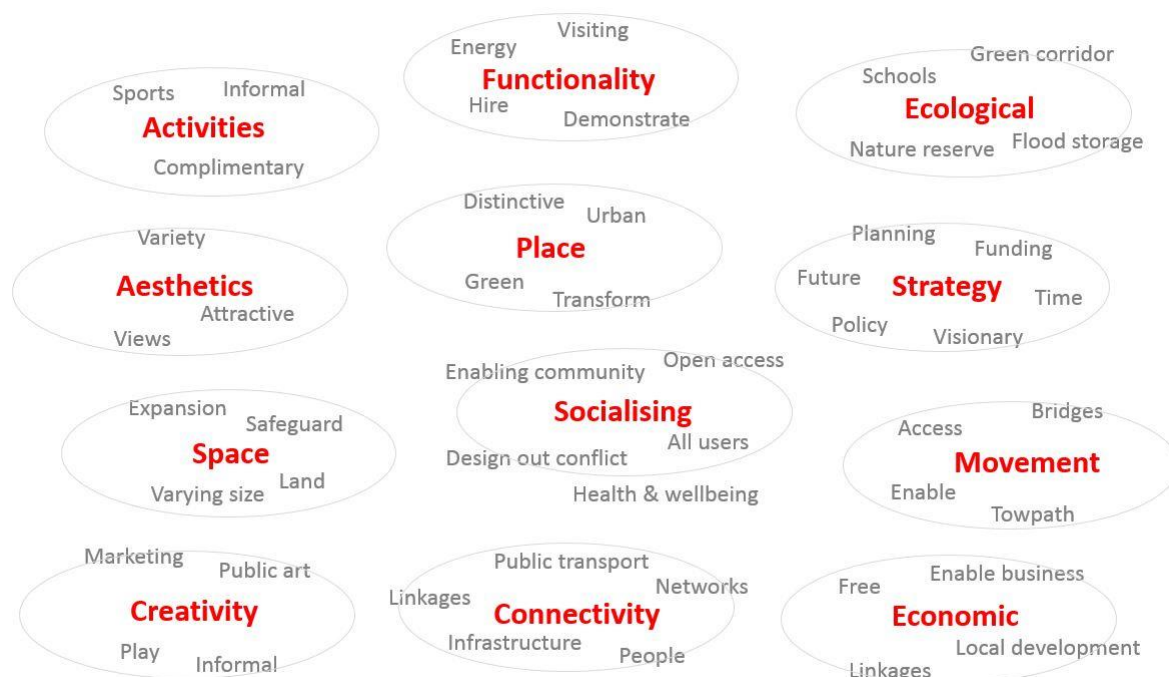


Fig. 6.9: Waterway Park criteria, after clustering and keyword analysis.

Through the activities of the workshop a set of elements of a Waterway Park were generated. Post-workshop I analysed these through a clustering process, looking for themes under which the elements would cluster. This process led to the Waterway Park criteria as presented in Appendix F. Including the identified themes there were near 100 elements to the criteria, and some of those were quite long. In order to make the criteria more accessible another analysis was

conducted identifying keywords from the themes groups. This version of the Waterway Park criteria is shown in figure 6.9. The Waterway Park criteria were circulated to workshop participants for comments.

Design Interventions – Workshop 1 – Findings & Outcomes

- A shared design vision was being co-created.
- Waterway park criteria were generated and captured.
- Workshop activities and discussions had raised FT qualities:
 - Situatedness in the consideration of the space around the blue infrastructure and the multiple scales it operated at.
 - Participation in prioritising the local communities involvement.
 - Pragmatism in harnessing opportunities from vision.
 - Flexibility in adopting new interpretation of project.
- Trust actors pragmatically recognising the potential opportunities the Waterway Park design vision offered.
- Waterway Park design vision helped participants think about the project differently:
 - Opened up the surrounding space for consideration.
 - Promoted consideration of the project at different scales/levels.

6.6.2 Workshop 2: Developing the Waterway Park Design Vision

The second workshop was held in a large seminar room at the Open University's Milton Keynes Campus. This was selected as it was situated as a convenient neutral ground. The aims of the workshop were:

- To reflect upon the Waterway Park criteria identified in Workshop 1.
- To examine existing BMK Waterway design proposals against the Waterway Park criteria.
- To contribute to the co-creation of the Waterway Park design vision.

The workshop was attended by nine expert case study actors, all of whom were previous research participants:

- Katie – O&H Properties senior manager (planning background)

- Saffron – Cen Beds LA senior green infrastructure officer (environmental background)
- Tim – Trust director (planning and LA background)
- Cecil – CRT senior officer (planning background)
- Chris – MVT senior manager (environmental background)
- Liz – Trust director (civil engineering and LA background)
- Marion – Trust director (political and LA background)
- Barry – Trust director (project management background)
- Joe – Bedford LA senior economic development officer (economics background)

Workshop Introduction

A presentation was given summarising the previous workshop and its outcomes. A summary report of Design Workshop 1 had been emailed to participants before the event and hard copies were made available on the day. Participants were asked to comment on the Waterway Park criteria, themes and elements that had emerged from the first workshop. Several Trust directors raised the practical concern that the Economic theme wasn't strong enough and that engineering was not represented. A couple of participants commented that energy, an element within the Functionality theme, was a concern, reflecting that, "...back when the Millennium waterway started we hadn't heard of Sustainability and green energy. What will it be in 2050?" Raising this issue was a good lead into the focus of the day's workshop. It acknowledged that priorities changed over time and started to get the participants to consider and discuss possible visions very relevant to a future sustainable infrastructure.

Group analysis of the waterway park design

Activity Aims:

- To get expert actors to review the Waterway Park criteria of themes and elements.
- To analyse existing Waterway design work against the Waterway Park criteria.
- To consider the applicability of different parts of the Waterway route for Waterway Parks.
- To promote the Waterway Park design vision with case study actors.

Activity Description:

The workshop participants were shown three A0 display boards laid out on tables. These boards each showed different design work describing visions of the waterway along different parts of the route. Each display board had a blank white border suitable for writing notes. The participants were asked to consider if the designs showed a Waterway Park, and to assess the designs using the Waterway Park criteria from Design Workshop 1. They were given marker pens and I instructed anyone who wanted should make as many notes and marks on the display boards as was necessary to record their thinking. The participants were split into two groups for the activity and given forty minutes to analyse each display board in turn. I accompanied group A making notes and left an audio recorder with group B.

- Group A = Tim, Cecil, Saffron, Katie
- Group B = Chris, Joe, Barry, Marion, Liz

Activity Theory:

A range of design work had been created for the Waterway throughout the project's life. However most of the designs were not generally visible, as they had not been collated and made readily available. They were not recorded visually in the A-Z (only referenced in its appendix) and copies of the work were stored with different actors. This activity aimed to make existing Waterway design work readily available to a group of expert case study actors. It brought the work together, made it visually accessible and then challenged the actors to look at the work from the perspective of Waterway Parks. It was hoped that in doing this the case study actors would consider different interpretations of the infrastructure project from the presently dominant Waterway design vision and reassess existing work from the perspective of the Waterway Park design vision. It was felt that introducing the consideration of the Waterway Park design vision would necessarily include sustainable criteria into the actors' assessments of design work.

The choice of which design work to analyse was influenced by a combination of factors: the date it was produced; the availability of images from which to produce the display boards; how wide

an audience it had gained so far; the need for work from a diversity of sources; and the need to compare different areas along the route.

The A0 display boards aimed to capture key design work and display it at similar scales in order to aid comparison. Where the design work was available in separate images these were stitched together to make one large continuous visual. A backdrop of satellite images was included to provide a recognisable visual context for the design work. The design work had not previously been collated and presented in this way and this style of presentation provided a visual impact that would help draw out constructive discussion concerning the design, the route, the Waterway Park criteria and the priorities for development. The display boards presented the following design work for analysis:

Board 1: Milton Keynes Waterway Park – This design work was commissioned by the BMKW Trust using Lottery funding gained from the Millennium Landmark competition and was produced by Landscape architects and civil engineers working on the Lottery funding bid in 2007. The level of design work was sufficient to enable this section of the waterway route to gain outline planning permission from Milton Keynes LA. The display image combined a series of eight separate design illustrations and applied a new satellite image background of the surrounding landscape (image detail shown in figure 6.10, LH panel).

Board 2: Marston Valley Housing Development – This design work was supplied by O&H Properties and represented their latest development proposal which had only recently been submitted to the Central Bedfordshire local authority for review. The design was created by contracted landscape architects and town planners in May 2014 to the criteria of O&H. The housing development shown is arranged in two villages with a total of 5000 households and on the site of a previous Ecotowns proposal. The waterway is shown to run through all the planned developments, maximising developments with water frontages. The display image was supplied by O&H as a marketing image with sidebar annotations linked to numbers over the image. For the purposes of the display board the sidebars were removed (image detail shown in figure 6.10, middle panel).

Board 3: Waterway Study: Green Lane to Bell Farm – This design work was commissioned by Bedford Local Authority from Halcrow and was the latest draft version at the time of the workshop (July 2014). It displays a detailed design proposal for the waterway routing developed as part of a civil engineering study. This design work was conducted in support of the Marston Innovation Park route side development and takes account of land elevation, construction earthworks and existing watercourse drainage channels. The display image combined five separate civil engineering drawings and applied a new satellite image background of the surrounding landscape (image detail shown in figure 6.10, RH panel).



Fig. 6.10: Detail panel of the three waterway design boards showing type of content and visual illustrative style (LH – Board 1: MK Waterway Park, M – Board 2: O&H Marston Valley development proposal, RH – Board 3: Waterway Study)

Each of the design visuals presented on display boards with a large white border sufficient to allow annotations from the participants. The display boards were of such size and weight that they could be laid out on the meeting tables to facilitate discussion and allow easy access to participants.

Activity Outputs:

After the introduction the separate display boards were laid out on different tables. The Marston Valley design work was new and unseen by the majority of participants. They all eagerly crowded around the display board and started to ask questions of its provenance and status. Katie of O&H was able to field the questions and provide answers. This process continued for each of the display boards. Trust directors explained the Milton Keynes Waterway Park and Joe explained the Waterway Study. Eventually the participants split into two groups and analysed each of the display boards in turn.



Fig.6.11: Workshop participants analysing current designs against Waterway Park criteria.

Generally the design analysis activity started with each group taking time to interpret and make sense of the design visuals on each display board. The participants tried to make sense of the designs using their own experiences of the landscapes at a human scale, for example finding points they had visited and were familiar with to use as reference, and writing notes next to places that had been difficult to identify. This sense making process was aided by satellite images from Google maps being used as a background, but made more difficult by the civil engineering drawings used in board 3 due to their lack of recognisable detail locating them in context. Often the impacts of change over time hindered the sense making process as the landscape had changed since the design visuals or satellite maps were created. This issue particularly affected the Milton Keynes Waterway Park display board whose design work was seven years old, a long time in the rapid development of the Milton Keynes built environment.

During the activity the participants often moved away from the task of analysing the designs as Waterway Parks and slipped into talking about securing the route. Stories would be passed between participants regarding the latest negotiations on a route section that was depicted in the design work. The discussion often naturally went back to the analysis activity, but sometimes a reminder was necessary to pull them back on focus.

The design analysis process was documented by participants with annotations made onto the display boards. All three annotated display boards are shown in Appendix F, with annotated display board 2 shown here in figure 6.12. The annotations focus on four general themes that appear across all boards:

1. Identification of features which were related to the Waterway Park. These features included: points and methods of access; concentration of green spaces; the different activities that were possible; and business opportunities.
2. Highlighting development opportunities that complemented the Waterway Park, such as a visitors' centre, water activities park and a campsite.
3. Commenting on the experiences for people travelling along the waterway, which included the sense of arrival on passing over Brogborough Hill and looking out onto the vista of the Marston Vale, and the points the route entered through gateways into Milton Keynes.
4. Identification of 'Rooms' and 'Corridors' along the waterway route. This categorisation was introduced by Tim and quickly taken up by other participants. It identified 'Rooms' as areas of the route that opened out and offered something of interest to engage the visitor/traveller. 'Corridors' were areas of the route which were closed in and mainly about the waterway making progress through the landscape. The participants concentrated on identifying the Rooms, and marked up thirteen in total. The concept of Rooms and Corridors was developed further in the workshop wrap up discussion.

Certain annotations were specific to each display board and were made by participants with more expert knowledge of that design work. On the Milton Keynes Waterway Park design Tim identified the alternative 'heroic' route to Willen Lake at A-Z section B2 (see figure 4.11). On the Marston

- Is there anything missing or which you would change?

In addressing the first question participants confirmed that they had not referred to the Waterway Park criteria much in the design analysis. Most participants voiced agreement with Tim's comment, "I don't think our group paid attention to the criteria. We were looking at a high level, at a typology in which all of the components were relevant". Other participants commented that the Waterway Park criteria would be useful when looking in more detail at smaller sections of the waterway. A participant from group A suggested that on reflection they had consciously used the themes 'place' and 'activity' to guide their analysis.

In fact group A had introduced their own criteria of 'Rooms' and 'Corridors' to conduct their analysis. They explained that Rooms were distinctive places that could be seen as a destinations, offering activities and drawing people in from their journeys along or near the Waterway, in much the same way a park does. A Room needed to have a sense of place and to provide inspiration, possibly through a piece of startling engineering such as a significant flight of locks or a spectacular boat lift. The Corridors were the counterpoints, places where the waterway channel negotiating through the landscape with difficulty. They were about mitigating the presence of roads or other negative environments.

Participants talked about how seeing the design work presented through the display boards had made them re-evaluate the waterway designs and think differently. Chris commented, "what struck me for the first time is that actually the delivery against the vision for the waterway park is not so far removed from where we are as we might have feared". Cecil added, "looking at these [display boards], when you've got the reality of the aerial photographs, suddenly I feel this is far more credible than it has been before". Participants agreed that if the board visuals were to be combined along the whole length of the waterway route this would be very powerful in communicating a more persuasive vision fitting with the Waterway Park.

Discussion turned to how the project should communicate its design work generally, in light of the impact of the workshop. Initially this discussion focused on the A-Z Project Delivery Plan (2012)

document, as the primary design source and a critique of its performance in that role. The Trust directors described how they had been reassessing the A-Z, recognising that it didn't perform its role satisfactorily and thinking about how it might be changed. Participants voiced their opinions, which included replacing the A-Z altogether, incorporating the visionary work seen in the workshop within the A-Z, and that the A-Z was not the right forum for such design work. Saffron summarised the discussion of the A-Z stating that it was, "too detailed to be visionary and not detailed enough to do delivery". Chris warned against dismissing the A-Z, and that its pragmatic approach of breaking down the route into sections was valid, helping the reporting and monitoring of progress. Through discussion participants identified that the A-Z should become more focused towards effective delivery, and should necessarily be complimented by something visionary. The idea for a new Vision Document gained traction which would capture the Waterway Park workshops' outputs, the criteria and display board visuals, and provide a place for aspirational design visions using iconic images. It was suggested that the format of the Vision Document should be an A3 paper document of maybe eight pages. There was some resistance to a wholly digital document, but Katie pointed out that the digital format had the benefit of being accessible from anywhere connected to the internet and that it was easier to modify and publish updated copy.

The group recognised the merit of the O&H Marston Valley proposal and its integration of the waterway within its design. They felt it offered an interesting vision of how the waterway might be delivered across that landscape and that it ought to be seen as such. However they also anticipated problems from the political issues inherent in presenting the waterway design embedded in the O&H housing development proposal to a wider audience. Katie emphasised the O&H perspective that "if they don't allocate this [Marston Valley development proposal] then they are going to get it piecemeal, as we are not going away". The understanding of the group was that in accepting the whole development proposal it would include lots of beneficial planning gain, specifically an integrated waterway, while if rejected O&H would have to force through smaller portions of the proposal over time and there would be much less cumulative benefit.

There was agreement that the proposal would meet resistance from the local MP and local residents, in the form of the Marston Action Group (MAG), especially considering the negative feelings the previous Ecotown project had generated. Chris promoted caution, observing that the public perceptions of the waterway being delivered through the housing development could prompt the question, “at what cost the waterway?” Which might result in an attempted trade, the waterway for accepting 1000 houses or even a flat refusal of the waterway if it comes with housing. He went on to comment that, “the Consortium includes members who might have difficulty in serving up this as a vision for the waterway... [it would mean] having a Consortium endorsed document which promotes something fundamentally at odds with the position they have taken to date”. Participants questioned how the Consortium thought this section of Waterway could possibly be built if not through collaboration with the developer, as the only source of money available at that time was through planning gain. This discussion in turn led to the suggestion that O&H should be invited into the Consortium, and it was agreed that enquiries should be made with Consortium members on initiating this action.

The workshop came to a close and participants provided positive feedback on the event. They had been impressed by the work that had gone into organising it and the impact of the design visions communicated on the display boards. Several participants commented that the workshop had provided a forum for discussions that would not normally have taken place within the regular schedule of project meetings and events. The Trust directors then invited me to present at the Annual Partnership Conference in four months time. They highlighted to me that I would be presenting next to the Northampton University academic who had conducted the ‘Water Adds Value’ research and that the MP with portfolio for inland waterways would be attending the conference. It was also suggested that my presentation would provide an opportunity to introduce the contentious O&H waterway design, as I would be viewed as an independent actor within the case study, which would remove political criticism of the Trust. I recognised that this might work politically for the Trust and practically for the project, however there was potential for my research to also be viewed as biased in doing so.

Design Workshop 2 - Analysis

Using the Waterway Park criteria of themes and elements as a basis for the participants to analyse existing design work had mixed results. Initial discussions on the criteria had drawn some responses to the basic criteria listing, but these were from some of the more pragmatic Trust directors and emphasised elements that already get attention through current design activities led by the A-Z, such as Economics and Engineering. The criteria were referred to very little within the design analysis activity, as the participants were so engaged with the display boards. Several times I prompted the participants, reminding them to refer to the Waterway Park criteria. Individuals used their own understanding of what a Waterway Park should be to guide their responses to the design work. Some participants introduced their own criteria, the Rooms and Corridors, which can be seen as drawing on the existing Waterway Park criteria, such as Places and Activity. The listing of the Waterway Park criteria as themes and elements was presented to the participants in the format shown in Appendix F. On reflection, and with the benefit of insight from further analysis of the criteria, this was a poor way to present the Waterway Park criteria as it was too long to read and reflect upon. The diagrammatic representation shown in Fig. 6.9, with key words selected from the elements, was generated after Workshop 2 and in hindsight would have better served the design analysis activity. Further, the detailed criteria presented at the workshop would have better matched analysis of a design at a more human scale.

Bringing together existing design visuals and presenting them in a new way opened up different possibilities for the case study actors, over and above the act of revealing what had been hidden in the project archives. The impact of the display boards showed how important a visual image can be in terms of engaging people with a vision and design proposals, even for those people who are already highly familiar with the project. The scale of the design work when brought together and setting the visuals against the satellite images of the landscape helped the participants situate the proposed infrastructure in its geographical context. The choice of visuals positively influenced the participant's appreciation of the situatedness of the designs, as they reflected on their labelling of features related to Waterway Parks. While initially the Waterway Park was only

associated with green, natural landscape of fields and woods, through this exercise associated features started to include the scope for physical activities and business opportunities, which fit within urban landscapes.

The criteria of Rooms and Corridors introduced in this workshop were very useful metaphors in aiding the analysis of displayed designs. As metaphors they relate directly to Architecture in that disciplines' definitive use of the terms (Stevens Curl, 2000), where corridors are narrow sections of a building primarily for transit between different areas. Rooms being discrete enclosed sections of a building given to a variety of activities. The terms also find use as metaphors in a range of other disciplines. In Urban Design (Lang, 2017) the term 'Corridor Plans' is used to denote where an urban plan follows alongside a transportation corridor, for example retail development alongside a road. In Town Planning (Cullingworth et al., 2014) the term 'Green Corridor' is used for a section of open space, usually narrow, which allows pedestrian access through greenspaces, for example rights of way and canal towpaths. In Ecology (Hilty et al., 2006) the term 'Ecological Corridor' is used to describe narrow spaces which provide suitable habitat for wildlife to safely traverse between much bigger areas of their natural habitat. The use of the Corridor metaphor in reference to sections of the Waterway Park is very useful as this can draw on the meanings associated with all three other disciplines. The Waterway Park corridor follows the transportation corridor of the Waterway, provides a green corridor for towpath users and has the potential to perform as an ecological corridor as it passes through built up urban areas. The term 'Room' finds very limited metaphorical use within these disciplines, presumably as they already have specific descriptors for the places that are linked up by the different types of corridors.

Considering the range of participants of the workshop, roughly half had professional training in at least one of the above mentioned disciplines. This could explain why the rooms and corridor metaphors became very powerful criteria for design discourse, as each discipline would bring complimentary aspects to the Waterway Park design vision. It also promoted a more mature understanding of the possibilities of the Waterway Park, as a room could just as easily be an

urban built environment as a green space. This use of these metaphors in the design discourse had promoted the development of situatedness in the approach of the participants.

The case for the creation of a Waterway Park vision document to balance the A-Z was strengthened by the workshop activities. The idea of a vision document was mentioned in the previous workshop. Here it gained clarity with recognition of the necessity of the A-Z as a separate document with a specific role around supporting technical project management. The design work as presented on the display boards had suggested suitable visual communications to support the Waterway Park design vision. This proposed vision document would be a new object which persisted in the project and influenced future design activities, strengthening the Waterway Park design vision and making the vision available for future interpretation.

The workshop participants turned to discussion of securing the route several times during the event, reflecting their normal group activities and their preoccupation with project management and the development of local solutions to the technical route issues. This was a normal course of conversation for the case study actors, but interest in the task at hand drew them back in, allowing the workshop to deliver in terms of its output.

In the extended wrap-up discussion of what to do about O&H's design proposal it was evident that political relationships between Trust and Consortium actor groups would restrict how these designs could be discussed and analysed by other actors. The pragmatic forces of politics and policy were stopping meaningful conversations about what the waterway could be and how it could be delivered. The only reason such an in-depth analysis and discussion of the O&H housing proposals had taken place, with the voice of O&H being heard, was due to the neutral forum that this academic research had provided. The workshop had served to further participation in the case study through allowing the expert case study actors to engage with a developer about the design process.

The combination of different visual communication methods and the development of new criteria, in the rooms and corridors, helped the participants interpret the project design as a

Waterway Park, and situating the design in its context. They showed flexibility as a group in their development of the Waterway Park design vision. The vision became more mature and nuanced as multiple different environments were seen as possible 'rooms' for a Waterway Park, such as the lake and urban hub.

Design Interventions – Workshop 2 – Outcomes & Findings

- Waterway Park criteria were developed and interpreted by participants in their development of new criteria, especially Rooms and Corridors.
- Strengthened the co-creation of the Waterway Park design vision.
- Participants gained new appreciation of existing design work within the project.
- Agreement was reached on need for Waterway Park vision document, and types of material it should capture.
- Visual communication of multiple designs at scale, combined with recognisable satellite images enabled participants to engage with design proposals and better interpret them as Waterway Park design visions.
- Development of Situatedness in considering Waterway Park design vision:
 - Including a wider range of features and across more varied environments.
 - Ability to move through different scales of designs.
- Improved quality of Participation in the case study:
 - Providing actors a forum to have new conversations about design.
 - Introducing a developer's voice into design discussions with key case study actors.
 - Starting negotiations to allow developers into a closed influential actor group, i.e. the Consortium.
- A pragmatic approach to include design proposals from land developers within project discussions, recognising the political tensions between project partners.
- Flexible interpretation enabled by visual communications and Rooms criteria.

6.7 Dissemination Stage: Communicating a Vision

The dissemination stage involved presentations of the research findings at two different events, the Consortium Meeting in October 2014 at Bedford LA offices and the Annual Partnership Conference in November 2014 at the Bedford Corn Exchange. The audiences at the events were quite different, but the messages presented were similar.

The goals of the Dissemination stage were:

- To communicate the findings from the research to case study actors and allow them to provide feedback.
- To promote a more sustainable design vision within the case study.
- To influence the case study future design activity to promote sustainable transitions.

Overview:

Event 1: The Consortium meeting had eleven attendees from senior roles, including the local Mayor, representing the Consortium member organisations. These were actors with strategic overviews of the project and the power to make decisions. Held at the Bedford LA offices the meeting lasted just over two hours with the research presentation lasting around thirty minutes. Following the presentation of research findings the Trust chairperson made a case for Consortium actions which would strengthen their delivery of the project. These changes would include re-organisation, new members, new project staff and updating the terms of reference for the Consortium. These strategic changes were potentially politically risky in terms of upsetting some existing Consortium partners. To support the call for change, the Trust Chairperson aligned proposals with a re-focus on delivering a Waterway Park and emphasised the pragmatic benefits of opening up Green Infrastructure.

Event 2: The Trusts Annual Partnership Conference had nearly one hundred attendees. They were a mix of interested public, enthusiast volunteers and professionals from a range of organisations currently involved with the creation of the waterway. There were also invited guests who the

Trust saw as impactful and from whom they were keen to gain support. The list of speakers included the Trust Chairperson, the Mayors of the three Local Authorities, the MP with portfolio for inland waterways, another academic responsible for the 'Water Adds Value' study into the wider benefits of waterway restorations, myself and finally the leader of the Trust community boat volunteers. The general tone and focus of the conference was sympathetic and supportive to the Waterway Park vision. In introductions and summing up the Waterway Park label was used for the project almost exclusively. The Water Adds Value research articulated the range of possible economic, social and environmental benefits, complementing the message of the increased benefits aligned to the Waterway Park design vision.

The presentation used for both events was very similar. It summarised the research findings, focusing on messages of relevance to the case study actors and steering away from a presentation that was overly academic in tone and content. However it should be considered that these findings were based on an early analysis, and that my later position on the findings was more informed and changed slightly.

The key findings presented to both audiences in the Dissemination event presentations is summarised in the following list:

- A Unique project
 - Public genesis. Not restoration. Rich geographical and socio-political context
- Project design activity
 - Focusing on techno-managerial, A-Z dominant, Doesn't address rich context
- Project labels and language
 - Range of labels and descriptions of the project, aligned to different design visions
- Fluid Transition Assessment
 - Highlights an unbalanced picture with lack of focus in areas of Situatedness and Participation in the Fluid Transition framework
- Focus on Waterway Park design vision
 - Now includes green infrastructure

- identifies with sustainability agendas, engaging with multiple social, environmental and economic benefits
- Outputs of Interventions : Strengthening Waterway Park design vision
 - Waterway Park design criteria
 - Visions of Future Waterway Park
 - Re-assessment of existing waterway design work
- Suggested future actions
 - Rename project to Bedford & Milton Keynes Waterway Park
 - Publish Design Visions document

At both events the next generation of the 'green blobs' diagram used in the intervention workshops, was a feature of the presentation (shown in figure 6.13). Again this diagram proved very effective in stimulating reactions from attendees and referred to in the various discussions and outcomes of both the meeting and the conference.



Fig. 6.13: Waterway Park diagram used in dissemination presentations.

Dissemination analysis

The dissemination presentations provided the emerging findings from research, detailed the interventions undertaken, promoted the Waterway Park design vision and gained feedback from the audiences through questioning and discussion. On a whole there was acceptance of the findings I presented, along with its critique of the project focus at present. The recommendations for actions, which centred on the adoption of a Waterway Park design vision, met with cautionary

approval. The event's questions and discussions mainly focused on the implications and implementation of these recommendations.

The proposal to focus on delivering an infrastructure against a Waterway Park design vision was a new concept for most of the presentation attendees. After the questions and discussions I believe the majority of case study actors were supportive of the proposal. Again the visual communications used in the presentation were key to this process. The 'green blobs' diagram was a stimulus for discussion, helping several of the Consortium attendees appreciate the potential of the Waterway Park vision, with one attendee likening it to 'beads on a necklace' with the waterway connecting up the places. Another attendee described the project as "a park, which happens to have a waterway running through it, which makes it even better".

There was resistance from case study actors who were invested in competing design visions. Questions from the floor at the Conference represented this conflicting discourse. One attendee questioned if making a Waterway Park would slow down the project delivery, a position representative of the Waterway visions focus on project management issues. Another question suggested I had rejected the Canal label, one that worked well in Germany for freight transport. I assumed this actor supported the Canal design vision and was defending it without any consideration of the national situatedness of the infrastructure, regards industry or geography.

One issue that caused discussion at both events was the recommendation to improve the quality of participation in the project activities. The Consortium actors recognised the importance of this issue, but also cautioned on its difficulty. They identified the different scales of community engagement (local, LA, regional, national) and questioned which ones should be done and when. Concerns were also raised about how to maintain a view of the 'big picture' within a context of increasing the number of inputs, ideas and priorities on the purpose of the waterway park, valid concerns for which the project must develop an answer. One answer could be a strong and adaptive visioning process, which acknowledges and embraces future change. An APC audience member focused on my call for more participation and rightly questioned the level of participation within this research. This allowed discussed the appropriate responses considering

the project's timescale, adding that this research had focused on improving participation between already engaged case study actors.

Ethnographic observations of the Conference provided some interesting insights. Prior to my presentation one of the active Trust volunteers made the unsolicited comment, "Pragmatism is OK but not at the cost of the integrity of the project". He had come to similar conclusion to the FT framework assessment, but from his position inside the project. Chris, a participant in all research activities and a promoter of the Waterway Park, talked to me during the networking time after the event. He provided an update on an insider's view of the project since the interventions, "Your work is having impact. There is a noticeable change in conversation topic and terms used. You are in a good position as an outsider to examine what is going on, point out things, ask questions and provoke debate, which is much needed". These comments were reassuring, that the research had been relevant and was having impact.

Dissemination Stage – Outcomes and Findings

- Promoted the Waterway Park design vision to over 120 case study actors.
- The majority of audiences acknowledged the findings and supported the proposed project recommendation, including focus on the Waterway Park design vision.
- Topics of discussion highlighted accuracy of Fluid Transition assessment regards project qualities that are present and absent.
- The discussions provided evidence of conflict between competing design visions.
- Participation was identified as both a priority and concern by case study actors.
- Ethnographic evidence supported progress of the Waterway Park design vision in impacting upon the infrastructure project.
- Visual communications were important aids in gaining case study actor appreciation of the Waterway Park design vision.

6.8 Interventions Summary

A series of interventions were initiated in the BMKW project, to address the concerns identified in an FT qualities analysis of the ethnographic and interview data. The FT analysis identified an imbalance in FT qualities, with pragmatism and flexibility dominant, and situatedness and participation lacking. Addressing this balance should place the project on a path to becoming a more sustainable infrastructure, and promote sustainable transitions.

The project interventions were focused around the promotion of the Waterway Park design vision, as this could be used as a proxy for sustainability issues. The interventions were delivered in stages; an engagement event introduced key case study actors to the research findings and proposed actions, two design workshops focused on developing the Waterway Park design vision, and two dissemination events summarised the research findings and promoted the Waterway Park design vision.

The design intervention workshops explored and developed the Waterway Park design vision. Through this process the design vision was co-created with a range of case study actors. These actors were mainly previous research participants, but also new voices were introduced. All the participants contributed to the co-creation process through identifying criteria for a Waterway Park and envisioning a future in which it existed. Participants analysed existing project designs against the Waterway Park design vision using the criteria and their own interpretations of the vision. The co-creation process and design analysis helped develop participants understanding and appreciation of the design vision. New criteria were generated which brought a more nuanced understanding of the potential of the design vision. Participants had initially focused on the green environment of grass and trees with which the park label is associated. The design vision started to be inclusive of different environments, including urban, built environments.

Using the Waterway Park design vision to look at the potential of the infrastructure took the emphasis away from delivering the blue infrastructure, and introduced the importance of the surrounding green infrastructure. This opening up of the space of the project enabled the

participants to interpret the infrastructure differently and imagine its many different mixed uses. The local community were also caught up in this opened up space of the Waterway Park and the designing activity started to include them in discussions, with their involvement and participation in the project becoming more important to the workshop participants.

The visual communications used in the workshops presented multiple designs at scale, which when combined with recognisable satellite images enabled participants to engage with design proposals and better interpret them against the Waterway Park design vision. Methods of co-creation and visioning were used to develop the Waterway Park design vision.

Through the process of the workshops participants had identified and developed the requirement for a Waterway Park vision document, which would capture the ideas and designs being created, and presenting them along with other new engaging illustrations. They recognised that this document could act as a sister document to the A-Z Project Delivery plan (BMKWC, 2012) to combat its dominance of the project design dialogue and its project management agenda.

The quality of Situatedness was developed in the project through the promotion and development of the Waterway Park design vision. Different scales were presented from the usual imagery of the A-Z, taking viewers away from the spatial dictate of the A-Z sections. Visual representations of project designs helped the participants to look at the wider aspect of the proposed designs. They started to appreciate the wider context of the design, seeing elements of the everyday lives and activities surrounding them. This was a powerful way of influencing the flexible interpretation and situatedness regards the project design.

Participation was improved through the interventions. The workshops provided new environments outside the usual confines of the project activities in which they could have different conversations around the project. Several new actor groups were represented in the workshops, introducing new voices to project design dialogue. These new actors included a land developer, which enabled their engaging in frank discourse about their design proposals for the

infrastructure passing through their development land. The land developer had been previously excluded from contributing to the project design discourse.

The dissemination of the research findings and the Waterway Park design vision reached over 120 case study actors. The majority acknowledged the findings and supported the focus on the Waterway Park design vision. Discussion with audiences identified conflict between supporters of competing design visions. Participation was raised by as both a priority and concern by case study actors.

Reflecting upon the interventions as a whole, they worked well and achieved the goals they set out to do. They successfully developed and promoted the Waterway Park design vision within the case study project, using this as a means to change the focus of design activities to be more situated in the context of the project and increase participation beyond the normal actor groups involved. The initial engagement interventions had gained the attention and support of key case study actors, who had in turn become design intervention workshop participants. The design discourse around the project had been shaped by the workshop activities, from the impact of the future casting, co-creation of the Waterway Park design criteria and the re-assessment of existing designs presented through new visual communication techniques. The interventions had not significantly increased the numbers of actors involved in design activities. However, they had been effective in bringing together actors who were important for the project's design discourse but didn't normally get the opportunity to meet and talk about design. Finally, the dissemination events had met with positive feedback and engaging discussions. Further evidence of the success of the interventions can be seen through the case study research impact discussed in section 7.4.

7 Discussion and Conclusions

This chapter discusses the doctoral research work as a whole, reflecting upon research findings and insights, drawing out key observations and the contribution to knowledge, closing with a number of recommendations for future research.

Firstly, aspects of the research are discussed which share the common thread of fluidity, across theory, context and time. This is followed by a discussion of the overarching research questions, evidencing how these have been answered. Next the outcomes of the research are addressed, both in terms of the contribution it makes to academic knowledge, and also the wider impact of the research in other contexts. This chapter reflects on the transitions theory employed in the research. It also discusses other theoretical perspectives that could provide different lenses on the research, or be informed by the research findings. Similarly, the research methodology is discussed and reflected on. The final sections of the chapter detail the research conclusions informed from the insights and contributions of the research and present the recommendations for future work.

7.1 A Fluid Thread

The Fluid Transitions (FT) approach proposed by Guy (2011) discusses how to enable fluid responses to design problems in the context of the built environment. It was developed in response to that sector's promotion of a 'one-size fits all' solution that reflects a singular pathway to sustainability, such as the optimisation of a production technology, e.g. off-site modular manufacture. Guy proposed that there are multiple pathways for transition to more sustainable futures and that design approaches should be fluid to adapt and change to context specific requirements. This research is concerned with testing theory through engaging with a deep case study and examining how that theory can help design activity adopt a more fluid response to the case study context.

From one perspective the case study of the Bedford and Milton Keynes Waterway (BMKW) is the relationship between it and the physical landscape. The BMKW project aims to map its future flow through the physical landscape that surrounds the proposed route(s). Additionally the project also journeys through a social landscape, negotiating both with the public who live nearby, and also through the political and policy boundaries that impact large infrastructure projects. The case study provides a window onto a time-bound slice of a project that has a long-term impact on infrastructure planning. Is this fluid journey that runs through theory, context and time just a chance occurrence or a more serendipitous synergy?

7.2 Research Questions

In this section the main research question is addressed first, providing an overview of the research findings. The sub-questions are then addressed in turn, focusing on particular aspects of the research findings. Some aspects of the research findings, such as design vision, are present in multiple answers, however detailed discussion of these aspects are primarily dealt with in response to a specific question.

7.2.1 Main Research Question

How can design, informed by the fluid transitions approach, promote a transition toward more sustainable infrastructure in the case of the BMK Waterway?

In response to this question the findings reflect specifically on two aspects of the research: the first is the ability of the Fluid Transition (FT) approach to fulfil its role in both assessing and guiding design activity; and the second, the importance and power of design visions within the BMKW project.

The Fluid Transitions Approach

The research gathered ethnographic and interview data over three years based on a longitudinal case study of the BMKW project. Findings identified through these activities were assessed against The Fluid Transition (FT) approach (Guy, 2011), described in section 2.4.5 and figure 2.8,

which provided a framework to explore research findings. FT proposes four qualities required in projects to enable sustainable transitions. These are the qualities of Pragmatism, Flexibility, Situatedness and Participation. Informed by the presence of these FT qualities in existing case study design activities, a series of design interventions were designed and implemented as part of the case study research. These interventions took the form of presentations, meeting discussions and workshops, each influencing the trajectory of the case study. The results from these design interventions helped engage with the FT qualities and explore potential design research opportunities to promote a more sustainable future infrastructure and support wider socio-technical transitions.

The findings from the ethnographic and interview data are summarised in sections 4.5 and 5.7 respectively. The data generated by each method supported the findings from the other, alongside providing unique observations on the project. It is these findings which were assessed against the FT qualities to create an understanding of the BMKW project through the theoretical lens of fluidity. The FT qualities assessment, detailed in section 6.2, identified that the BMKW project showed strong evidence of Pragmatism and Flexibility though lacked representation of the qualities of Situatedness and Participation. The prevalence of Pragmatism and Flexibility were particularly evidenced in the priority given to project management activities; the focus of design activities on immediate issues; and the lack of ownership and accountability for design decisions within the BMKW Trust. Too little Situatedness meant discussion was focused on the technical issues of localised, small scale solutions circling around decisions of the waterway route and its impact. Limited Participation meant there was also a lack of diversity of 'voices beyond the normal nexus' (Guy, 2011) and therefore a limited representation of stakeholders in design-related participation. This included stakeholders who often wield power such as developers; in this instance their opportunities to engage in project design discussions were limited by political issues such as the need for local authorities to remain neutral regards planning proposals.

The process of carrying out the FT quality assessment was not informed by a prescribed methodology. The research approach listed findings against related FT qualities and mapped their

influence across the project. This process was conducted as objectively as possible, however, on reflection an examination of other alternative suitable methods would provide different perspectives on the connections between FT qualities and the research findings. This is further discussed in section 7.6.

Each FT quality has been reviewed individually in terms of how that quality was evident in the case study and how the design interventions influenced the status of that quality. These observations inform a reassessment of the post-interventions status of FT qualities in the research as a whole.

Pragmatism was observed to be a dominant quality influencing activities in the BMKW project. This was reinforced by the pragmatic responses from case study actors to research activities. They gave considered responses to research findings which were sometimes critical of BMKW project activities. Many case study actors, including some of the more sceptical, participated in design interventions which were outside the scope of usual BMKW activities. Engaging with the research in these ways was seen as being 'open to multiple theoretical frameworks' (Guy, 2011), as case study actors connected with the outputs of the FT approach through discussions about research findings in the BMKW Trust project meetings and also readily participated in the two Waterway Park workshops as part of this research.

The FT approach encourages Flexibility through openness to different design possibilities. The desire for 'interpretive flexibility' (Guy, 2011) to influence the project design was present within the case study, with many actors described the different experiences and opportunities they expected the infrastructure to provide them. For example boaters wanted to sail wide beam craft across to the Western fens; anglers wanted to fish on its banks; cyclists desired to commute along the towpath; environmentalists wanted the wide diffuse borders to create new wetlands; local public sought to enjoy tranquil waterside parkland; and many political actors desired increased regional economic activity. Whilst individual actor groups tended to prioritise their own demands, it was the development of design criteria and narratives through the workshops that brought them all together, under the auspices of a unifying Waterway Park vision.

Guy (2011) describes Situatedness as location that matters in many ways. It concerns the physical qualities of location, such as topography and biological environment. Equally it connects to the social qualities of location, such as the people, their place and the activities they conduct there. Through the intervention workshops a developed sense of Situatedness evolved in the BMKW project, as participants developed their vision of a Waterway Park to include more of the surrounding social and environmental aspects. This challenged the technical project management issues presented as 'designed infrastructure' in the A-Z Project Delivery Plan (BMKWC, 2014).

Exploring issues of Participation in the case study found that even the voices of the normal nexus weren't all being heard or making a difference to the project plan. The design workshop interventions brought together existing, though quite diverse actors and enabled them to contribute to a process of co-creation of the Waterway Park vision. Invitations to participate in the design interventions workshop were sent to organisations representing potential future infrastructure users. However only one organisation sent an actor to attend, who then struggled to contribute to the workshop activities. This actor's difficulties in participating were due to a lack of confidence when faced with the other participants, who were all members of the Trust or Consortium and using technical project language. The difficulties of gaining meaningful participation in architectural design and town planning project activities are well documented (Innes & Booher, 2004; Greenbaum & Loi, 2012). Where the interventions did deliver was in gaining increased participation between existing case study actors. An actor from a land development company attended the second design workshop, presenting their latest design proposals. The workshop became a forum for interaction between actors who did not normally meet, enabling new discussions around the co-design of planned housing adjacent to the BMKW route. Following the workshop participants petitioned for land developers be represented at Consortium meetings. This politically difficult suggestion was already on the Consortium's agenda and proved to be a major step forward for case study participation, possibly providing the foundations for future initiatives. However the Consortium was conservative in their approach to increasing participation, refusing land developer membership as politically problematic, whilst at

the same time ironically measuring design workshop success on the number of new actors who attended the events. These situations resonate with Ainstein's (1969) critique of participation in the town planning process and are discussed further in section 7.5.

Based on these observations it was considered that the BMKW project better represented FT qualities as a result of the research undertaken and specifically, as a result of the design interventions in developing a co-designed vision of a Waterway Park and in promoting a transition to a sustainable future infrastructure.

A diagrammatic summary of how the FT qualities have been affected by the design interventions from this research is provided in figure 7.1. The diagram is directly comparable to figure 6.3, which summarises the case study status at the time of the FT quality assessment and uses the same diagrammatic conventions. The black text highlights the main impacts from the design interventions on each of the FT qualities found in the case study. The red grid visually represents the post-research state of the FT qualities influence over the case study.

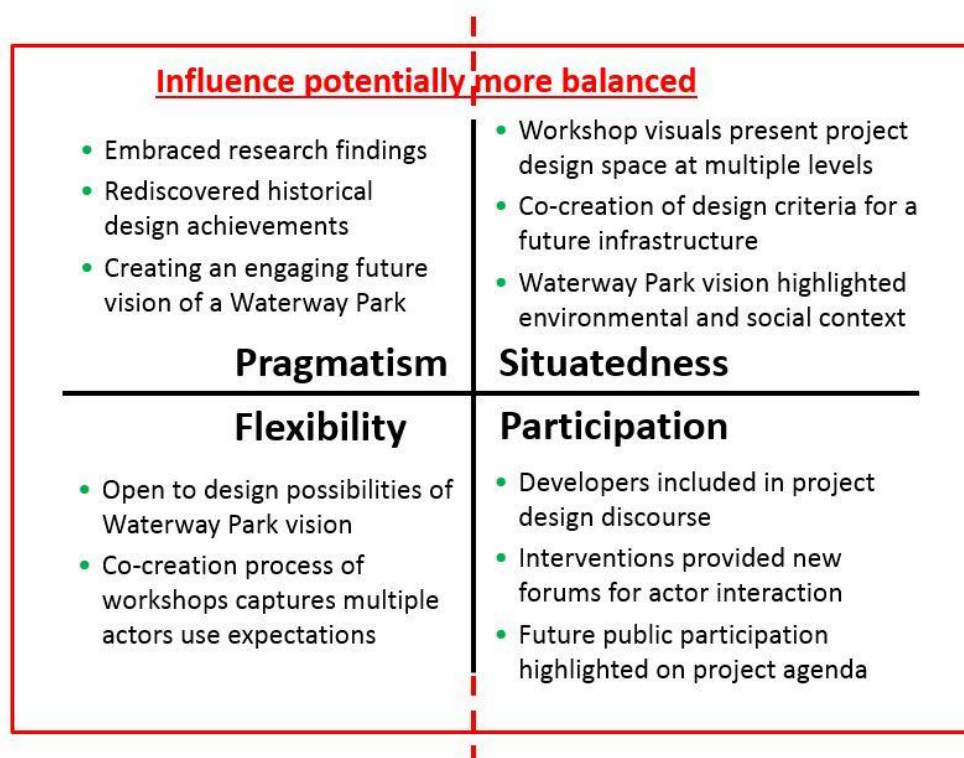


Fig.7.1: Summary of impact on FT qualities in case study post intervention (black) and the balance of influence between all the qualities (red).

Design Visions

This research identified three competing design visions based on the everyday names used to label the BMKW project: the Canal; the Waterway; and the Waterway Park (all visions are detailed in section 4.3.4). Of these the Waterway Park design vision was identified as particularly important as a unique infrastructure terminology that had been created as a result of this research. A small group of case study actors promoted the Waterway Park through their exclusive use of that name for the project. They constructed an engaging vision around the Waterway Park label using the narratives created through the various project discourses. The Waterway Park was described as a mixture of blue and green infrastructure, varying in width along its length. This vision for the BMKW viewed the activities enabled by the land surrounding the water infrastructure as of equal importance to waterborne activities. The Waterway Park offered wider environmental and social benefits than the other visions. In interviews actors who promoted the Waterway Park aligned it clearly with their desire for an infrastructure that addressed sustainability issues. The Waterway Park name and its associated design vision was their chosen way to raise these issues into the project design discourse. This key insight from the research led to the adoption of the Waterway Park design vision as the central theme for the design interventions.

The design interventions focused on developing the Waterway Park vision that was emergent in the project. The Waterway Park vision became a proxy for sustainability issues, introducing the sustainability agenda into design discourse without explicitly naming it so. A series of presentations and workshops developed the Waterway Park vision with actors from a range of case study groups. These interventions helped create design criteria for a future Waterway Park and supported participants in re-evaluating the existing design outputs. Through these activities the Waterway Park design vision enabled the development of an engaging project narrative.

Using a vision to focus the interventions in the case study was instrumental in successfully influencing the BMKW projects on-going design activities. This conclusion supports other design literature addressing visions linking to sustainable transitions. For example, employing the

Waterway Park vision gave workshop participants a shared focus for imagining possible futures together (Van Dijk, 2011; Dunne & Rabby, 2013), whilst also removing the constant pressure to deal with the issues of now. Contemporary literature on Transition Design (Irwin et al., 2015) identifies a framework in which 'Vision for Transition' is one of their areas for knowledge, action and self-reflection. They identify that "more compelling future-oriented visions are needed to inform and inspire projects of the present", adding that these visions should be "dynamic and grassroots based, that emerge from local conditions" (Irwin et al., 2015). The impacts of the Waterway Park design interventions support the observations of these literatures on design visions.

Employing visions to drive design interventions can be seen as analogous to Meadows (1999) seminal paper concerning the different places to intervene in a system. Building on the system analysis theory of leverage points, where small shifts in an aspect of a complex system can produce big changes in everything, Meadows proposes a series of nine leverage points associated with increasing levels of impact. If the design interventions around the Waterway Park vision are seen as a leverage point for change which acts upon the infrastructure system, then it is comparable to the second most powerful leverage point defined by Meadows: intervention at the level of 'the goals of the system'. As the interventions refocused activities towards delivering a Waterway Park, the goals of the infrastructure system changed from enabling waterborne transportation between two destinations to something wider and more inclusive. Workshop outcomes projected a new goal: the development of an artery of both green and blue infrastructure to create ecological, social and economic regeneration of the surrounding area over a long time horizon. This wider and more inclusive goal for the Waterway Park vision resulted in deeper consequences across the system of infrastructure, which fundamentally changed its focus to delivering future sustainability.

7.2.2 Research Sub-question 1

What design practices are evident in the case study and how do they influence the infrastructures future sustainability?

In response to this question the range of design practices evident in the case study are described and their influence on the infrastructures future sustainability is discussed, as is how the design interventions influenced these perceptions.

Ethnographic data gathered from the BMKW project illustrated many different types of design practice were evident in the project. Their primary focus was the technical issues around civil engineering and town planning. Consequently the majority of design work supported these activities through addressing the proposed routes, sections of the route(s) and the interaction of these proposals with adjacent land and urban developments. This limited focus of design activities was a rational response to the immediate and visible challenges at hand and, as such, very much emphasised the dominant influence of two FT qualities; Pragmatism and Flexibility.

Historical design practices were evident, partly captured in the A-Z Project Delivery Plan (BMKWC, 2014) and also found in BMKW Trust archives. However older historical work was difficult to access due to sporadic archiving, the responsibilities for which having previously passed between actors and been subject to different protocols of physical documentation. Early on in the research it was recognised that if design activity and interventions for transition were to be influential in this project then protocols for record keeping and access to information would have to be improved. It was felt this degree of transparency would enable design activities to influence a wider group of case study actors and provide a legacy of decision-making across the necessarily long-term nature of the infrastructure project.

The main design practices which were manifest in the case study can be described by the following groups: visual communications, design objects and design thinking. Each of these groups will be discussed in turn, focusing on the case study, the design interventions and how research findings have potential to influence the future sustainability of the planned infrastructure.

Visual Communications

The production of visual communications was the most obvious design practice within the case study. This was due to their quantity, visibility and accessibility to many different project actors.

These visuals were always communicated in two dimensions, although some illustration visuals were the result of design work with three dimensional computer packages. Older historical visual communications tended to be illustrations presenting visions of a completed project, such as the view of Brogborough Hill shown in figure 4.10. This corresponds to the focus of project activities at the time of their production, which was to engage with the public and foster their support for the project. More recent visual communications focused on illustrations of technical issues using predominantly 2D top down maps at various scales and levels of simplification. These visual communications supported a pragmatic focus on project management and technical routing issues.

The kind of visual communications found in the case study had changed over time reflecting the focus of project activity: shifting from engaging and illustrative, to technical and informative. The design interventions offered the opportunity to develop new visual communications for the BMKW project, supporting the creation of a Waterway Park vision and representative of fluid transition qualities. However, Situatedness was found to be a submissive FT quality lacking influence in the case study. One of the main reasons for this assessment was that the A-Z Project Delivery Plan (BMKWC, 2014) dictated a fixed perspective upon the infrastructure through presenting only one scale of map. Additionally project discussion almost exclusively focused on technical geographic issues relating to town planning. The design interventions addressed these issues by focusing on visual communications which presented the project at multiple scales, and asked the viewer to consider wider aspects of place including environmental and social interactions and impacts.

For the purposes of this discussion the Koolhaas et al. (1994) understanding of scale is employed, which acknowledges that meanings and practices vary with different people. Koolhaas identifies Small, Medium, Large and Extra Large as broad measures of scale which offer a level of ambiguity. This is useful as there are no absolute measures for scale, but rather scale is a function of context. The BMKW project exists at multiple scales, from the extra-large scale as a major additional link in the national infrastructure network, right down to the small scale of an underpass allowing boats

and pedestrians safe passage. This leads to the infrastructure being involved with lots of life activities, from trans-regional flood management to the place an individual angler chooses to fish. The design interventions brought together visual communications representing all scales. These visuals used different illustrative techniques to display the greatest amount of life activities involving the infrastructure. Figure 7.2 gathers examples of the visual communications used to represent different scales of Situatedness. A range of activities appropriate to that scale are listed to set a context. For each scale a pair of visual communications are presented which have the same area or feature as their subject matter, comparing a less situated one against the more situated alternative used in the interventions. For example, at the medium scale (M), the most commonly presented scale in the case study, the activities associated with the village are viewed as being at the medium scale. The less situated medium scale visual communication is taken from the A-Z Project Delivery Plan (BMKC, 2014) and shows a broad indicative route over a representative map of Milton Keynes. The comparable more situated image shows illustrations from the Milton Keynes Waterway Park lottery bid overlaid onto satellite imagery of Milton Keynes. The more situated visual communication connects the viewer to the characteristics of the place the route travels through and suggests the possible activities that might be conducted there. It is notable that no situated visuals were available for the extra-large scale, perhaps indicative of the lack of a national vision for a sustainable future.

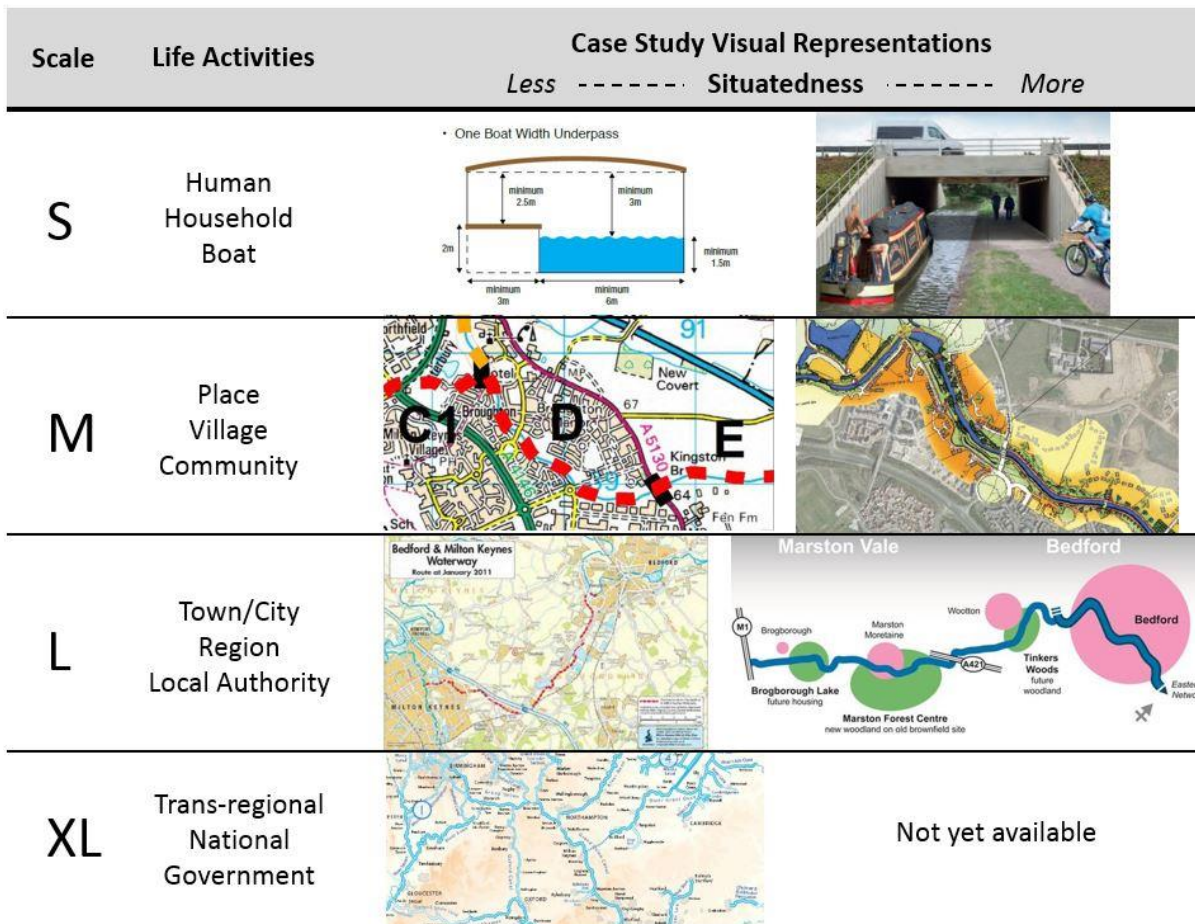


Fig. 7.2: Contrasting visual representations of different scales of Situatedness.

In the second design intervention workshop participants were presented with a range of more situated visual representations of route sections at medium scale. In analysing these against the Waterway Park design criteria, which they had previously developed, many of them offered comments and reactions which suggested they had changed how they perceived the infrastructure. The rooms and corridors metaphors (see section 6.6.2) was introduced in discussions to describe how the BMKW would vary its depth of interaction with the surrounding landscape, both physical and social, along its length. This reflected an increased level of ‘interpretive flexibility’ (Guy, 2011) from participants as their interpretation of the Waterway Park vision was now flexible enough to encompass built up ‘grey’ environments and not just classic green park land. Participants commented that they were looking anew at design work they had previously thought themselves familiar with. They concluded that new illustrations should be commissioned that provided more contextualised visual representations of a Waterway Park design vision, in order to better engage with the wide range of people currently unfamiliar with

the project scope. These new perspectives and requirements for redesigned visual representations led in time to the production of the Waterway Park Vision (BMKWT, 2016) which is described in section 7.4 and Fig. 7.6, addressing research impact (see also Appendix H).

The outcomes of the workshop based design interventions had an impact on future BMKW project design activities, where visual representations were acknowledged as powerful objects for improving the influence of Situatedness and the success of the BMKW project.

Design Objects

A range of objects were found in the case study, which while not physically part of the BMKW infrastructure, had been designed for the BMKW project. These 'Design Objects' held influence over design activities conducted by the BMKW Trust and related to the physical infrastructure.

The main design objects found in this case study were:

- The A-Z Project Delivery Plan
- The Community Boat
- The Developers Guide

The A-Z Project Delivery Plan: This document was prolifically distributed throughout the case study and dominated the project design discourse. Consequently the route sections it described became the dominant spatial container and the scale of the visual communications used became the standard scale to assess design, both negatively impacting project Situatedness. The A-Z focused on the technical project management agenda and supported the dominant Waterway design vision. This document demonstrates the power that design objects can have in reinforcing the way design practices that inform visions are considered and carried out.

The Community Boat: The building and operation of the BMKW Trusts recreational day trip boat is a pragmatic method of providing visibility for the BMKW project to a wider public and engaging Trust volunteers in constructive activities prior to the building of any physical infrastructure. The public engagement potential of the boat is mainly aimed at boat enthusiasts, but it does offer other types of engagement opportunities. The interior could be modified to offer space more

adaptable for a mix of uses. The Waterway Park vision could be marketed to the boat-oriented audience more explicitly, so it is recognisable as a separate issue to the operation of the boat.

The Developers Guide: this a document created to communicate to land developers the requirements for, and benefits of, engaging with the BMKW project. However it only presented the minimum technical requirements necessary to provide for a waterway channel and towpath. The guide has the potential to be improved by promoting the requirements and benefits of a Waterway Park design vision.

Through participating in the design interventions several project actors identified the need for a new design object. Workshop participants resolved to bring together new illustrations and design visuals of differing scale within a new document, the 'Waterway Park Vision document'. They reasoned that such a document was necessary to balance the A-Z Project Delivery Plans technical focus by providing an engaging design vision which would be useful in promoting the project to the widest possible audiences (see section 7.4, Fig. 7.6 and Appendix H).

Design Thinking

The lack of access to design skills, tools or funds leaves actors primarily contributing to design through discourse. The majority of time at Trust meetings was spent talking about technical routing issues and the design changes that could address them. It is this talking and name giving that creates descriptions of possible futures for the BMKW project. Thus these acts became design activities themselves, helping to create the design visions which have been identified as so influential.

7.2.3 Research Sub-question 2

Who are the actors within the case study informing design practice for sustainable transitions?

Given the broad definition of design recognised in this work, "to initiate change in man made things" (Jones, 1970), then many actors inform the design practice within the infrastructure case study. However few of them were positively influencing design practice for sustainable

transitions. Those found to be doing so can be split into three: actors promoting the Waterway Park, external professionals and the researcher.

The actors promoting the Waterway Park design vision were having the most positive influence on design practice for sustainable transitions. Identified through the ethnographic observations many of these actors participated in the interviews. There they articulated their reasoning for supporting the vision, which closely aligned to sustainability issues. These alignments are discussed in detail in 'The Waterway Park' ethnographic narrative of section 4.3.4 and in the discussion of the main research question. Actors in this self-selecting group enthusiastically believed that the BMKW offered great potential to deliver a range of environmental and social benefits. The actor group didn't necessarily agree on what all these benefits were or how they would be delivered but they did share a desire to ensure that the best possible infrastructure for the region was being created, and agreed that the Waterway Park vision provided an opportunity to do this. One interviewee, Chris, stated that if they ended up building a Canal then they would have failed. The presence of this actor group emphasised the necessity for a project to have a motivated group of champions who promote activities supporting the sustainability agenda. All the actors involved in the promotion of the Waterway Park were articulate professionals and respected within the BMKW project. It is very likely that without their support for this research and the Waterway Park vision that resulted, that this work would have had a far more limited impact on the case study.

Professionals external to the Trust and Consortium were regularly involved with the BMKW project through tasks relating to paid roles and input on a pro-bona basis. Most notable of these was David Lock Associates (DLA), a town planning and urban design consultancy, who regularly provided guidance to the Trust on the development of the project. An example of this is found in the ethnographic narrative describing the Wavendon Distribution Park, detailed in section 4.3.3 and figure 4.14. DLA became involved at points in the project when pressing problems had arisen and design solutions were required to help to deliver positive outcomes for the BMKW project. From discussions at Trust meetings it was obvious that the help from DLA was down to key

employees choosing to contribute their time and expertise and that this input was not necessarily reflective of the opinion of their whole organisation. Their role in firefighting around design-based decisions demonstrates the critical role of professional designers in the delivery of the project. This was particularly relevant as the infrastructure shifted from a narrowly conceived channel of water, the canal, to a broader area of infrastructure in the form of the Waterway Park.

It must be acknowledged in any discussion of this research question that the researcher and the activities of the research had a major influence on the design practices within the case study. As a participant observer, once the researcher moved from gathering data and started to intervene in the case study through presentations and workshops, the focus and intent of their influence was to change design practice. Through acknowledging this intent, detailing the methodology used and reporting the results of the interventions as objectively as possible, the researcher's influence is recorded and made as transparent as possible (see section 3.3.6).

Actors involved in BMKW project changed over time, even during the relatively short time period of the case study. This was due to several reasons including changes in employment and personal circumstances. Indeed in several unfortunate circumstances, Trust volunteers left the BMKW project due to ill-health and sadly, even a death. This raised issues of continuity which could become critical to the future of the BMKW project. As the project was mainly driven by public support and the efforts of volunteers how would it survive as time brought change to these groups? The professionals in the organisations of the Consortium would change over time and future support might be jeopardised. Of particular concern was the age demographic of Trust volunteers, which was made up almost exclusively of retired people in their sixties or older. As the project carries on into the future to meet a suggested completion date of 2050, questions concerning ongoing support and voluntary contributions surface. Will future generations have the same relationships with inland waterways as older generations and be able to connect with the project and support it in the same way? Hopefully many generations will grow up having pleasurable memories of holidays on canal barges, cycling along a towpath or fishing from a river bank which will spur them to action. This issue makes a strong case for increasing the participative

reach of the project to the wider communities in order to capture the interest of potential future BMKW Trust volunteers. These issues are perhaps addressed in part by the creation of engaging and persuasive visions of a Waterway Park which can provided representations of this vision to have the widest appeal.

7.2.4 Research Sub-question 3

What are the key elements of a sustainable transitions design practice?

Many of the design elements of this research have been discussed in detail in response to the previous sub-questions. In this section they are consolidated and described as a framework of design elements.

Fluid Design for Sustainable Transitions

The identification of the key elements of a sustainable transitions design practice has been guided by the theoretical lens of the Fluid Transitions approach and the context of the case study design project. Methods were employed to influence the design elements within their context and guide the project on a transition pathway to sustainability. For this discussion the elements are gathered into a framework for Fluid Design for Sustainable Transitions (FDfST), which is represented through the schematic diagram shown in figure 7.3.

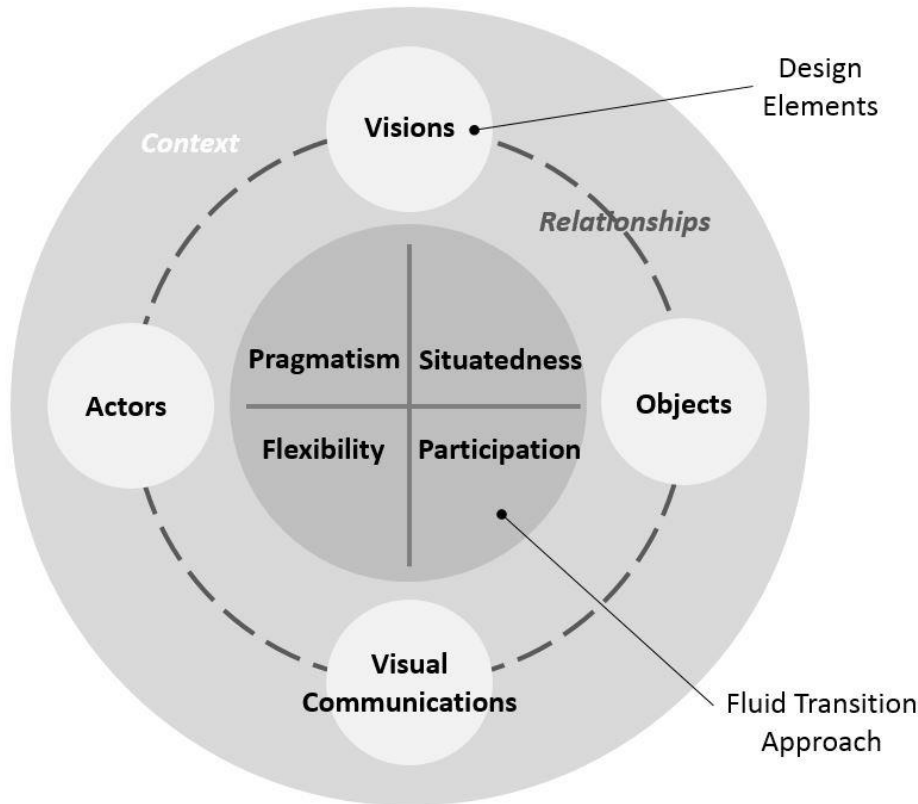


Fig. 7.3: A Framework for Fluid Design for Sustainable Transitions

A description follows for each of the elements identified as part of the framework for Fluid Transition to Sustainable Transitions:

Fluid Transition approach

The FT approach provides the theoretical lens that sits at the centre of the framework. It has a central role in assessing and guiding design activity within the context of the project. Through the FT lens the project context is assessed based on the four FT qualities: Pragmatism, Situatedness, Flexibility and Participation. The outcome of this FT qualities assessment provides guidance on how other design elements in the framework should be utilised. The response to the main research question discusses this design-oriented view of the FT framework in more detail.

Visions

Design visions are used to capture the details of a desirable future state (the outputs of transition). They function as a mixture of both inspiration to work towards and a set of standards

to measure progress against. The design vision persists over time, providing an engaging, durable, yet dynamic narrative, across the lifespan of a project.

The design vision was the key outcome of the intervention methods of this research. The main research question discusses the power of visions upon design activities and specifically, the validity of the Waterway Park vision to this case study (see section 7.2.1). It was a grassroots vision, originating from within the project, and grown with the support and persistence of a range of project actors. The impact of the design vision upon this case study was such that it is considered to be the primary design element of the framework and informs how all other framework elements are utilised.

Objects

A project creates objects which are the result of design intent, but are not physically part of the main project. These design objects then exist alongside the project, as agencies in their own right, with opportunities to promote agendas, support visions and influence Fluid Transition qualities. The design objects in the BMKW case study have been discussed in research sub-question 1 (see section 7.2.2) and were seen to be highly influential upon the result of the FT qualities assessment.

Visual Communications

Visual Communications are outputs of design practice which provide powerful representations of a design project. They take many forms including sketches, diagrams, technical drawings, illustrations and maps. They can employ a range of techniques to focus on different types of information and represent a project at different scales. The range of visual communications employed in the BMKW case study is discussed in research sub-question 2 (see section 7.2.2). This research work identified how certain types of visual communications have the potential to develop the FT quality of Situatedness within a project, by helping actors more easily engage with a design vision and develop a greater appreciation of the context of a project.

Actors

In the context of the design project a wide range of actors influence design activities. The identification and engagement of those actors who champion sustainability issues within the project is important for successfully implementing the FdST framework. These actors have the greatest potential to become involved with design activities directed by the framework. Their being involved in co-creating project outcomes which are favourable to the sustainability agenda means they are more likely to continue to promote the vision and its design initiatives to other case study actors and into the surrounding context. The range of actors involved in the BMKW project is described in the ethnographic data chapter (see section 4.2.2) and in the discussion of research sub-question 2 (see section 7.2.2).

Context

In this research, context refers to the case study on which the design practice in the framework is focused. The term context is used because it is able to capture the broad nature of social, environmental, economic and technical issues that impact the project and which need to be considered when designing for sustainable transitions. The ethnographic data discussed in chapter 4 also provides further insight of other context issues which had influence on the BMKW project. The inclusivity of the term context provides opportunities for the FdST framework to be employed on very different types of project, from the built environment to projects that arise in different sectors or disciplines.

Relationships

There is a complex web of relationships between the different elements of the FdST framework. They have the potential to influence and inform each other in ways that are obvious, subtle and hidden. For example the Design Vision for a project has strong relationships to other framework elements, informing them and they in turn enable and support the vision. This web of relationships between all the elements and the context is represented in the FdST framework (see figure 7.3) as a simple dotted line. Employing the framework requires a designer to be

conscious of the relationships that exist within the project and act upon those they are aware of and prepare to recognise those which are hidden.

Methods

Methods are not identified as a framework element in the diagram of figure 7.3, but their discussion is necessary. Methods are employed in and across the elements of the framework, for example to promote the design vision, produce visual communications and examine the context. Methods employed as part of the FdST framework must be chosen for their appropriateness to the task being undertaken, with consideration of the elements and relationships involved. Within the BMKW project, methods employed through the design interventions for example, were based on established approaches found in design and business literature. Examples of these include: design thinking methods which opened up design activities to wider participation; co-creation methods which helped multiple participants contribute to the creation of both design vision and supporting criteria; and engagement methods which can help open a design dialogue with a wider audience. A sufficiently broad and established body of literature exists around methods (Brown, 2009; Curedale, 2013) to allow the practitioner employing the FdST framework to decide which is appropriate.

7.2.5 Research Sub-question 4

How can a fluid transitions approach be integrated within design practice in order to deliver effective sustainable outcomes?

Integrating Fluid Transitions

The Fluid Design for Sustainable Transitions (FdST) framework integrates the Fluid Transitions (FT) approach into design practice. The framework uses the FT approach to both assess design activity in context and guide design activity in relation to the framework elements. This research proves evidence of the utility of the FT approach in both assessing and guiding design activity. The methods employed for the design interventions in the BMKW project included scenario-building, storytelling and visioning among others. These enabled the satisfactory implementation

of the design elements of the FdST framework. However the methods used to assess the design activity of the context against the FT qualities could be improved upon particularly around issues of implementation and repeatability, and this is reflected on in section 7.6.

Delivering Sustainable Outcomes

The sustainable outcomes that this research aims to contribute towards are firstly the creation of a more sustainable infrastructure and secondly enabling wider societal sustainable transitions. These outcomes are future focused and can only be evaluated for their actual impact from a future perspective; this means that assessing their potential and their achievement is difficult by normal, often quantitative, measures. Instead we look to literature to understand how sustainable transitions happen over time and allow this to inform our assessment of sustainable outcomes.

This research project case study represents a short slice of time in the lifespan of the BMKW project where its whole lifetime, from concept to delivery of a sustainable infrastructure, may be as long as 50 years. This is a short period of time in comparison to an infrastructure's usable lifespan, during which it could play many roles in sustainable transitions. The research aims to influence the BMKW project to become both a sustainable infrastructure and be part of a wider sustainable transition. In sustainable transitions literature this journey of a project over time is commonly referred to as a 'transition pathway' (Geels, 2002; Foxon et al., 2009). The fluid transitions approach (Guy, 2011) proposes that there is no singular transition pathway and sets out to support multiple transition pathways, as exemplified by Grin et al. (2010).

The BMKW infrastructure steers a journey through time to deliver a sustainable outcome, and to do this well it should embed transitions thinking. Through this research the FT approach has been used to influence the BMKW projects' design practices, hopefully nudging the overall project onto a transition pathway. However, as this particularly research concludes, the BMKW journey is still only a relatively short distance along its transition path. Over time the status and context of the BMKW project will change resulting in a shift in the balance of FT qualities that will require new

and different design responses. This is a reasonable expectation given that over the history of the project thus far its priorities and directions have changed a number of times. For example around the time when British Waterways conducted the Public Jury on route selection the FT qualities of Situatedness and Participation were much stronger. This shows a changing balance of FT qualities overtime, supporting the concept that, to achieve optimum value, the FDfST framework should be applied within the BMKW project over periods of time, to guide the project along a sustainable transitions pathway.

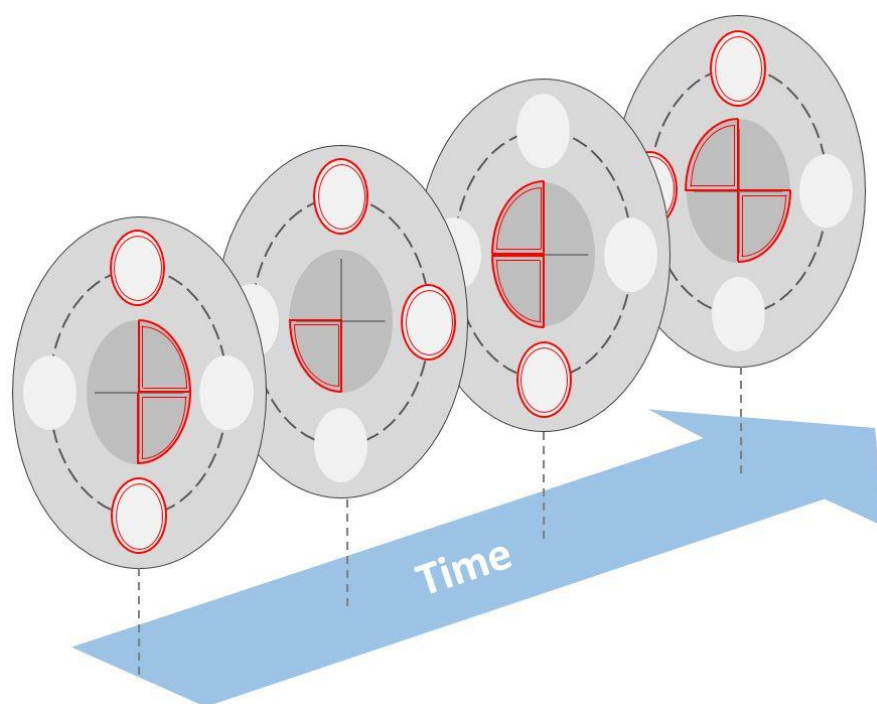


Fig. 7.4: The framework for Fluid Design for Sustainable Transitions deployed over time, emphasising in red the qualities and activities requiring effort on each deployment.

Based on the observations and findings from this research, it is likely that each time the framework for Fluid Design for Sustainable Transitions (FDfST) is applied to a project a different balance of FT qualities and contextual issues will be identified. Different design approaches and activities will be relevant at different times to promote a balance of FT qualities. Figure 7.4 illustrates the changing focus of design activities over time as the FDfST framework is deployed at different intervals. The diagram shows different FT qualities and design elements highlighted in red for each FDfST framework deployment as they become the focus of design activity. In this way

the FDfST framework could help a project respond to changing contexts and priorities to deliver what constitutes sustainable outcomes at different points along the transition pathway.

Timeframe for Sustainable Outcomes

The creation of design visions for the BMKW project was a key element in the FDfST framework. However imagining a project's future and predicting what might transpire is an impossible task. From the position of an 'unsustainable present' the idea of a sustainable future can be very hard to imagine, as it is abstract, ambiguous and perhaps also controversial. Some of the insights from the BMKW case study suggest that considering a range of different future scenarios across the transition timeframe, may help this visioning task.

The Waterway Park provided a design vision of a future sustainable infrastructure. Through consultation with case study actors a pragmatic date of 2050 was identified as realistic for operational completion.

There is another example of a future design vision being created in the BMKW case study. The pragmatic focus on building the waterway through planning gain was inevitably going to produce isolated sections of the waterway (see section 4.3.2). Whilst this could be seen as a troublesome disadvantage, some actors responded flexibly to this emerging issue and chose to envision the wider benefits and opportunities associated with each isolated section of the waterway route. For example, they described a future narrative where an isolated section of the waterway created a water feature in attractive recreational parkland, contributed to localised water management in the form of a Sustainable Urban Drainage system, and provided opportunities for viable wildlife sanctuaries, increasing bio-diversity. They named this design vision 'Linear Ponds' and placed it in a short term timeframe (see sections 4.3.2 and 5.6.1).

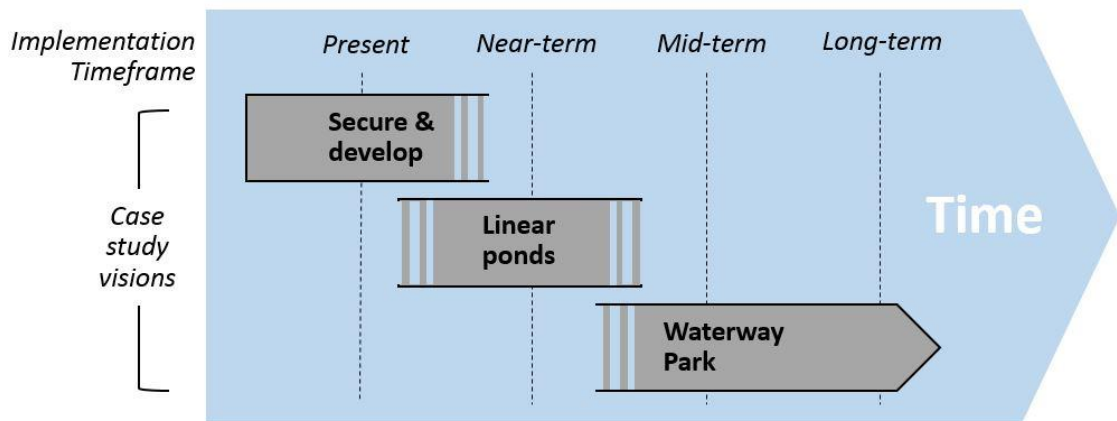


Fig. 7.5: Case study visions which support the BMKW project transition pathway, mapped over timeframes into the future.

In their approach to design visions over time BMKW case study actors plotted a course for the transition pathway of the BMKW infrastructure. The short term design vision of the Linear Ponds was created and promoted by case study actors. Through the intervention of the research, guided by the FT approach, a design vision for the medium term was popularised in the form of the Waterway Park. The long term vision for the BMKW project became an extension of the Mid-term vision as a completed Waterway Park continued to operate and evolve into the future. All these case study design visions are shown in figure 7.5, mapped over the different implementation timeframes. The success of the Linear Ponds and Waterway Park visions suggest that placing design vision in the near- to mid-term timeframe is more effective than focusing on long term goals which are more abstract and difficult to connect to.

7.3 Contribution to knowledge

The contributions provided by this research work are both theoretical and substantive in nature. They contribute to the knowledge of theory in both Sustainable Transitions and Design, focusing specifically on adaptations to the Fluid Transitions approach to reflect design theory and approaches.

While the basic aspects of the FT approach were set out by Guy in 2011, the methods and tools needed to operationalise it as an analytical and practical approach were lacking (Cook, 2014;

Jabeen & Guy, 2015). This research uniquely draws upon design methods to apply to a Fluid Transition approach and thus makes a significant contribution to the theory of sustainable transitions and the value of design visions in framing sustainable goals over time.

There is a lack of design theory that articulates the role of design practice in sustainable transitions. Through the design interventions employed in the research, which were guided by the FT approach, an understanding was generated of how design could influence a project onto a transition pathway. The development of the framework for Fluid Design for Sustainable Transitions (FDfST) provides a framework for design transition practice. This framework and its design elements are a significant contribution to the provision of guidance for the role of design practice in sustainable transitions. This claim is substantiated by the impact witnessed in the case study after its deployment through the research interventions, which is detailed in the following section on research impact.

Lastly this research utilised a mixed method approach in a detailed longitudinal case study of a unique and significant regional infrastructure project. It linked a range of design methods and approaches to the Fluid Transitions theoretical framework to provide insights into framing a long-term project through design interventions.

7.4 Impact

This section focuses on research impact, knowledge generated by the research which contributes to, benefits and influences society, culture, the environment and the economy. This research had the potential to impact academia through several communication avenues, but more importantly produced significant noticeable impact within the real world context of the case study of the BMKW project.

Academic Impact

Over the course of the research findings and outputs were communicated to primarily academic audiences, but also included a mix of industry and public representatives. Academic impact was developed through a number of events where the research and its contribution to knowledge has

been presented. These include: a series of three posters, each presented annually as part of the Open University Research Poster Competition at the Milton Keynes campus; a poster presentation at the UK Infrastructure Transitions Research Consortium 2014 conference at Clare College, Cambridge; and the presentation of a peer-reviewed paper at the International Sustainable Innovations 2013 conference held at the University of the Creative Arts in Epsom, UK (Rowbotham et al., 2013).

The academic work presented at these different events stimulated conversations with a range of academics from multiple disciplines, along with representatives of external organisations, such as Local Authorities, the National Infrastructure Commission and the Town and Country Planning Association. While there is no explicit measure of impact of these academic outputs, they did provide opportunities to gain valuable viewpoints and commentary on the research and stimulated the researcher to consider issues from new perspectives, particularly through discussions that highlighted relevant literature from different disciplines.

Impact in the BMKW project

The impact of the doctoral research in the BMKW project was wide-ranging. Probably the most impactful intervention shifted the previously dominant Waterway design vision towards the newly crafted Waterway Park design vision, which expanded the scope, impact and outcomes of the overarching project vision. These changes in the focus of the BMKW project provided evidence that the project had moved from a 'hole in the ground' infrastructure project to one that was now concerned with its own transition pathway towards creating a sustainable infrastructure. These observations were made possible through access to Trust marketing material, meeting minutes, the Annual conference and ongoing and informal conversations with key project actors.

After the final dissemination intervention at the Trusts 2014 Annual Partnership Conference (APC) Chris, a long time research participant, identified that the focus of discussion at BMKW meetings had notably changed to include Waterway Park related topics sympathetic to a sustainable transitions agenda. In the year following that APC the Consortium formally changed its name,

replacing Waterway with Waterway Park. Trust communications and marketing material, in both print and digital, started to identify the project as a Waterway Park and included descriptions of the environmental and social benefits it would provide.

The most striking research impact came through the formation of a Spatial Vision working group, which brought together actors from the Trust, Consortium and David Lock Associates (a supportive regional urban design consultancy), in order to develop and capture the Waterway Park vision in a form that could be widely communicated. A participant of the group argued the case for the focus of their activities, “the A-Z shows how the project can be delivered, but nothing currently shows why it should be delivered!” (Email from Chris, 2015). Requests were made for my participation, however I was only able to supply them with outputs previously generated in the design interventions workshops. My focus at that time was on writing the thesis and I wasn’t willing to re-engage with the case study through further ethnographic or intervention activities.



Fig. 7.6: The Waterway Park Vision document (BMKWT, 2016), centrefold visual.

The work of the Spatial Vision working group culminated in the production of a Waterway Park Vision document (BMKWT, 2016) which was given a public release at the Annual Partnership Conference in May 2016. The document took the form of an A3 double sided poster entitled “A Vision for the B&MK Waterway Park”. It used images and illustrations of Waterway Park visions at various scales, from small to medium. These were layered over a larger scale illustration of the

whole of the waterway route, set against satellite photo imagery of the surrounding landscape. It is shown in figure. 7.6 and in full in Appendix H. The document also provided a Waterway Park vision statement and listed the associated benefits, including “providing a catalyst for environmentally led regeneration... increasing biodiversity... and improving regional water management” (BMKWT, 2016).

Here was the new design object which had been discussed in the second workshop focused on design interventions (see section 6.6.2). Its purpose was to clearly communicate the whole Waterway Park design vision. It used the same visual communications techniques regards scale, focus and style adopted in the workshop, and subsequently presented to the whole Trust. It provided a list of features and highlighted images that correlated with those places of activity that the ‘Room’ metaphor had focused on. The creation of the document had brought together a wide range of actors to participate in co-design activities for the BMKW project. The Waterway Park Vision document was a manifestation of all the framework for Fluid Design for Sustainable Transitions had aimed to achieve, including all its design elements of objects, vision, visual communication and actors (see section 7.2.4).

Case study activities such as: the use of Waterway Park design vision terminology in Trust marketing material; the consortiums change of name; the publishing of a Waterway Park vision document; and the combination of visual representations across multiple scales the Vision document used. These all link back to the content and outputs of this research and provide formal evidence of its impact in driving the BMKW project towards a transition pathway to a sustainable infrastructure. Without the interventions and influence of this research these case study design-related activities would not have happened.

7.5 Reflections on Theory

The Fluid Transition (FT) approach (Guy, 2011) was the main theory informing this research. It provided a useful and effective theoretical lens for both assessing and guiding design activity within the case study project. The open, non-prescriptive nature of the FT approach and its

associated qualities allowed for it to be adaptable and open to interpretation. This helped create an understanding of the context of the case study and possible design activities. The theory's non-prescriptive nature also allowed for sufficient flexibility to accommodate a range of design interventions that enabled a nudge towards a transition pathway in a somewhat unique context.

There is limited published peer-reviewed literature around the FT approach, and what there is suggests the theory is adaptable enough to focus on different types of design project. Cook (2014) looked at employing the FT approach to inform the design of Product Service Systems to provide more future sustainable outcomes. Jabeen & Guy (2015) used the FT approach as a lens to examine the links between urban shelter, poverty and climate change. They identified a design approach they termed Fluid Engagements, which prioritised a participatory design role for the local community. This suggests that the Fluid Design for Sustainable Transitions developed in this research could have wider applicability than infrastructure projects, given its FT origins.

The FT approach requires assessment of the case study through the lens of four qualities: Pragmatism, Flexibility, Situatedness and Participation. Guy (2011) provides limited guidance around these qualities and the characteristics of design activities that may manifest in the project. Additionally no assessment process or tools are specified which was problematic, as the researcher would have benefitted from a way of formalising the assessment process to help make sense of the data generated. Suggestions for such a methodology are made in section 7.6.

This research found that Situatedness and Participation were lacking influence in the project, and appropriate design activities were promoted through the intervention workshops to address this imbalance. Within the context of this research, it is for these two qualities that further theory has been sought to inform future research.

Situatedness was found to be highly influenced by the design practice of visual communications, which could assist the viewer in considering different aspects of the context. Taking guidance from Rose (2007) on the interpretation of visual materials it may be beneficial to consider the combination of anthropological and social theory put forward by Appadurai (1986) who suggests

that visual objects have a social life alongside people. The insights that this theory may provide, in combination with an approach to understanding scale (Koolhaas et al., 1994), see section 7.2.2, could also greatly inform the deployment of the visual communication design element of the FDfST framework.

The quality of participation is not a new consideration for the BMKW project. As a major piece of infrastructure that must gain planning permission, it falls within the boundaries of town planning. Theory in this discipline has struggled with the notion of participation in the planning process and it is recognised as a very difficult issue (Innes & Booher, 2004; Greenbaum & Loi, 2012).

Arnstein's (1969) seminal text on participation within the planning process describes the levels of participation as a ladder, with the top rung being the most desirable. In assessing the BMKW project against Arnstein's (1969) Ladder of Participation, the most favourable assessment is that it has reached the sixth rung of eight, achieving a level of 'partnership for citizen control'. This would mean the project has negotiated an arrangement between public and powerful actor groups to share planning and decision making responsibilities. This reality is likely given the public driven nature of the project and the potential of the Consortium to be a power sharing organisation. However this ignores some of the dysfunctional aspects of the project identified in the case study research, where experts under the employ of land developers take design decisions away from the Trust. Based on this assessment the BMKW project could easily be demoted two rungs on Arnstein's ladder to 'consultation for tokenism'. Here the public are invited to give approval and the number of people surveyed is viewed as the important metric of recognition; this sounds very similar to the nature of the response received during the Consortium dissemination intervention (see section 6.7). Arnstein's (1969) theoretical insights may prove useful in assessing the true level of participation in a design transitions project.

The quality of participation also needs to be recognised as an important signal of a design transitions project. Future BMKW project work needs to engage the local community in its design. To this end Transition Towns (Hopkins, 2008) could represent a theoretical model of participation. It is a grassroots movement of localised groups of people concerned with the unsustainable

present. They aim to make changes, in real-time, in their localities, as a step toward developing a sustainable future. Fundamentally this concerns grassroots actions that will contribute to sustainable change, making a place and its people more resilient to that change. Aligning and combining the BMKW project with a Transition Network initiative has the potential to bring an increased level of grass roots participation.

Returning to design as the mechanism through which the FT qualities are influenced, the literature engages with participation through the fields of participatory design and co-design. These fields offer theoretical work which could inform collaborative design practices (Lee, 2008; Keshavarz & Maze, 2013; Anderson et al., 2015).

The Fluid Design Transitions approach guides design practices undertaken in the case study to reflect the FT quality assessment. The design methods employed are commonly used design techniques and methods found in current design literature and practice (Curedale, 2013). Through examining the design activities undertaken within the case study interventions the most important and effective activities in influencing the FT qualities were identified. These design activities were formalised through the development of the framework for Fluid Design for Sustainable Transitions. The framework contains design elements which are groups of activities combined with objects from the case study which contributed to developing transition design activities.

Of the framework design elements, vision was most important as it framed the interventions and the other elements. The key role of visions only became apparent during the case study interventions. Other design literature identifies a key role for visions around enabling sustainable transitions. On reflection this literature is relevant and could further inform the vision element of Fluid Design for Sustainable Transitions. Key literature supports the vision elements proposal for a methodological framework to improve wider participation in the back casting process, a process which was used in the first design interventions workshop (Quist & Vergragt, 2006). Wright et al. (2013) present work on using visioning specifically to respond to climate change, which could have narrower applications to specific design projects. Finally lessons may be learnt from two

visioning exercises carried out to help cities become low carbon and more resilient, detailed by McGrail et al., (2015).

During the period of research activity other design theory has been developed about design and its role in sustainable transitions. The work developing a Transition Design discipline (Irwin et al., 2015) at the Carnegie Mellon School of Design is most prominent. They present a Transition Design framework of “four mutually reinforcing and co-evolving areas of knowledge, action and self-reflection” (Irwin et al., 2015), which includes: Visions of Transition; Theories of Change; New Ways of Designing; and Posture & Mindset. There are many similarities between their approach and the FT design approach. The framework promotes: context, place based, human scale designs, akin to situatedness; a pragmatic flexibility to cope with the ambiguity and shifting values present in transitions; and participation through a co-operative and community focused approach to design. The words used to describe the FT qualities might not be present, but they promote design foci which in essence, emphasises these qualities. The Transition Design discipline as presented by Irwin et al. (Irwin et al., 2015) is widely reflective of other theories about design and change.

The work of Wahl & Baxter (2008) exploring the designers’ role in facilitating sustainable solutions might add useful design theory around designing for sustainable transitions, particularly when considering the researcher’s role in the design interventions as both participant and observer.

In summary, the Fluid Transition approach has proved effective as a lens to both assess and guide design activity towards contributing to sustainable transitions. The role of the designer engaging with the four qualities of the FT approach could benefit from a more theoretical understanding of the issues that surround the person and process. This is particularly the case with participation and situatedness qualities, and specifically their relationships to design. Visions and visual communications both have related design theory which could inform their effective implementation.

7.6 Reflections on Method

A key aspect of this research involved participation in a long-term project that had the potential to provide tangible outcomes and create real world impact; it was also the aim to contribute to the development of knowledge that aided both theory building and practical insights into designing for sustainable transitions.

The research also needed to take into account the researcher's background and skills as a designer. In this case the researcher had personal work experience of problem solving and design interventions, and a personal interest in boats and waterways. This helped provide opportunities to create new design activities as part of the research.

A diverse mix method approach worked well in the project. Using interviews and ethnographic observation provided multiple sources of data which created a more informed understanding of the case study and provided a range of sources to triangulate specific observations. The ethnographic observation activity inherent in creating a longitudinal case study allowed for a deep understanding of the activities within the BMKW project. It also allowed time to develop engagement with case study actors, earn trust, and gain access to their closed groups and the information that resulted from these interactions.

Having a background in design meant that the researcher could employ a design perspective in creating intervention activities, and in the processes used to understand where gaps in knowledge existed and what design could add to the project. The design activities of the interventions were undertaken in collaboration with key case study actors, as a process of co-creation that was facilitated in the workshop sessions. The level of case study impact described in section 7.4 is testament to their success.

The ethnographic observation, interview methods and interventions all relied upon the voluntary participation of case study actors. One validation of the internal credibility of the research activities and methodologies was the continued participation of many of the key case study actors across all of the activities. Many participated in observations, interviews, and interventions,

suggesting that they saw value, and time wisely spent, in supporting the research aims and objectives.

Some parts of the research methodology ran less smoothly, and although satisfactory results were achieved, in hindsight different methods may have been better employed to make tasks easier and more effective. Analysing and making sense of large amounts of both ethnographic and interview data was a struggle. A pilot study exploring ways to look at data may have proved beneficial in making more informed choices on how to analyse the data as the volume of data increased. After discussion with academic peers a cross cutting grid methodology was identified as a helpful device to look at the themes emerging in the interview data from the use of the flexible template.

The assessment of the aggregated findings from the ethnographic and interview data against the Fluid Transition qualities was a critical stage in the research. The results of this FT quality assessment were the basis for guiding the design interventions. However no mechanism or procedure was identified in FT literature, and the methodology eventually employed was a practical approach to making sense of the empirical data against the concepts underpinning the qualities of fluid transitions. This assessment of FT qualities produced an awkward task that has questions over its repeatability. On reflection other methods would have potentially made the analysis easier and more repeatable. For example, the method of force field analysis, initially developed by Lewin (1946), is a social science methodology that examines the forces acting upon a 'situation' (or field). The forces are mapped out as hindering or helping the situation, creating an assessment of the status of the situation. While the situation Lewin developed the method for was initially focused on a person's psychology, the situation could be adapted to reflect an assessment of individual FT qualities within the case study.

This research identified visual communications as an important design element of the Fluid Design for Sustainable Transitions framework. In any future research employing the FT approach to analyse a design project more effort should be given to understanding the visual communications that are already present. Rose (2007) identifies a range of visual methodologies for the

interpretation of visual materials. Based on the theoretical understanding of methodologies that Rose (2007) presents the visual communications present in a project similar to the BMKW could be analysed through a form of discourse analysis. This methodology would necessarily assess visual communications for: how they were made; the site of production; what genre they took; who made them and who for? The level of understanding about visual communications this methodology could provide has the potential to inform both the assessment and application of the Fluid Design for Sustainable Transitions framework.

7.7 Conclusions

- The Fluid Transitions approach proved to be an adaptable and effective theoretical lens to both assess and guide design activity towards providing a sustainable outcome.
- The intervention of Fluid Transition guided design activity within the Bedford & Milton Keynes Waterway project has provided strong evidence of research impact, showing the project has adopted a wider Waterway Park narrative and embarked upon a transition pathway towards becoming a future sustainable infrastructure.
- A framework for Fluid Design for Sustainable Transitions (FDfST) has been developed which identifies key design transition project elements as: vision, visual communications, objects, actors. These design elements operate in relation to each other, and in connection to the fluid transitions theoretical lens, its context and methods.
- Visioning was the most powerful design activity of the FDfST framework, exerting influence over all others. It was most effective when focused on near to mid-term implementation timeframes where scenarios were more readily visualised by wide-ranging project actors.
- The research demonstrated the opportunities of a Fluid Design for Sustainable Transitions framework to influence the sustainable transition of a large and long-term infrastructure project.

7.8 Recommendations

Recommendations for further work focus on the following areas:

- Develop the Fluid Transitions approach as a means to assess and guide design activities.
Particularly focusing on the identification of methodologies for conducting assessments of the Fluid Transitions qualities, utilising force field analysis as one possible approach.
- Revisit the BMKW case study at future points in the project's timescale to understand: the impacts of the design interventions conducted in this research; the project's journey along its transition pathway; the changing emphasise on FT qualities and what design interventions have resulted in resilient outcomes.
- Develop a more detailed understanding of the design elements of the framework for Fluid Design for Sustainable Transitions through applying the methodology to other types of design project, including projects situated in different contexts, sectors and disciplines.

Appendix A: Projects Ethics Documentation

Information Sheet

Design & Innovation Group,
DDEM Department,
MCT Faculty.



Participant Information Sheet

Research Project: Design for Fluid Transitions to Sustainable Infrastructure

Principal Investigator: Alex Rowbotham, Doctoral Researcher

Research Supervisors: Dr Emma Dewberry & Dr Matthew Cook

Research Summary: The broad aim of this research is to identify how design practices can enable sustainability. Achieving sustainability will require great change, involving a wide range of groups and factors, at all levels of society, called a transition. This research hopes to show that design has a role to play in enabling and guiding this transition to a more sustainable future. Academic theories exist around transitions, explaining what they are and how they happen. Of these only the Fluid Transition approach attempts to address the role of design, and so it will be used to guide the research and choices of design activities.

This research will focus on the development of the proposed Bedford & Milton Keynes waterway. The inland waterways infrastructure is a suitable focus as it has a rich historical narrative of change driven by social and technological transitions. Given our present unsustainability, the waterway is used to help explore how we can design a more sustainable future.

Research Activities: This research will involve both experts and the public in a range of research activities, including; observation of meetings/events, interviews and the analysis of existing documents/data. Exploratory research will progress through a number of phases, focusing on suitable design practices and locations on the waterway. This will lead to workshops/events where public and/or experts will engage with design practices, utilising graphics, displays and models.

Role of Participants: This research will be conducted to the ethical standards and protocols of the Open University. Participation in this research is voluntary, with participants providing consent through signing a form prior to their involvement in the research. Participants can withdraw their consent at any time which will result in unprocessed data being withdrawn from the study.

The Bedford to Milton Keynes waterway is a unique project being the only new UK waterway currently proposed. The organisations involved in the project are easily identifiable and therefore the levels of anonymity the research can provide are limited. Consequently this research will name organisations involved while ensuring individual participants will remain un-named. Participants identities will be protected through the use of pseudonyms and non-specific descriptors based on their roles, with the data they provide coded accordingly. All personal details will be made secure as soon as possible through storage on the OU's secure servers.

Information gathered through this research will be used for educational or research purposes, including publication. Participants can elect to receive a copy of the research findings. Research records will be retained for 5 years after the completion of the project.

Contact details for further information:

Alex Rowbotham, Venables Building, Open University, Milton Keynes, UK. MK7 6AA

Tel: 01908 659608 Email: alex.rowbotham@open.ac.uk

Participation Consent Form

Design & Innovation Group,
DDEM Department,
MCT Faculty.



Consent Form for Persons Participating in Research.

Research Project: Design for Fluid Transitions to Sustainable Infrastructure

Name of Participant: _____

Name of Principal Investigator: Alex Rowbotham

1. I consent to participate in this project, the details of which have been explained to me, and I have been provided with a written statement in plain language to keep.
2. I understand that my participation could involve an interview, meetings and/or workshops, which may be audio-recorded with my consent, and I agree that the researcher may use the results as described in the plain language statement.
3. I acknowledge that:
 - a. the possible effects of participating in this research have been explained to my satisfaction;
 - b. I have been informed that I am free to withdraw from the project at any time without explanation or prejudice and to withdraw any unprocessed data I have provided;
 - c. the project is for the purpose of research;
 - d. I have been informed that the confidentiality of the information I provide will be safeguarded subject to any legal requirements;
 - e. I have been informed that with my consent the data generated will be stored on Open University secure servers and will be destroyed after five years;
 - f. data from me will be referred to by a pseudonym in any publications arising from the research;
 - g. I have been informed that the organisation I represent could be named in any publications arising from the research;
 - h. I have been informed that a summary copy of the research findings will be forwarded to me, if I request it.

I consent to my participation being audio-recorded ☐ Yes ☐ No

I wish to receive a copy of a summary project report on research findings ☐ Yes ☐ No
(please tick)

Participant Signature: _____

Date: _____

Contact Information: Alex Rowbotham. Tel: 01908 659608 Email: alex.rowbotham@open.ac.uk



Alex Rowbotham is a B&MK Trust member and is studying for a Ph.D. at the Open University. His research looks at how we can design the B&MK Waterway for a more sustainable future.

views with key people, analyse historical project documents and continue my observations of project activities. All these activities will allow the research to focus onto a particular area of the project where design practices can be implemented and studied. The exact nature of the later phases of the research are yet to be determined, but for example may be some form of exhibition or workshop which allows for public participation and engagement.

Although I'm interested in some big goals, it is the practice of design which I'm focusing on exploring in the research. Design is classically seen as solving problems through the creation of products and buildings. Design can also be about wider activities: such as creating services, improving communication and

of the project where design practices can be implemented and studied. The exact nature of the later phases of the research are yet to be determined, but for example may be some form of exhibition or workshop which allows for public participation and engagement.

Any surprises?

Initially it was the range of people and organisations actively involved. The B&M Waterway Trust and the B&M Waterway Society, the B&M Waterways Consortium represent commitment and enthusiasm from the public, commercial and civic sectors. I was surprised at the level of progress achieved in defining and safeguarding the proposed route, achieved through these groups working together and adopting a pragmatic 25 year timescale to completion. More specifically I have noticed the range of language used to describe the project, which seems to have moved from 'canal' to 'inland waterway' to 'waterway park'. These changing terms can be seen as reflecting that a contemporary waterway project needs to accommodate a wide range of users and appeal to a diverse local public, in order to reach completion and become a 'waterway for all'.

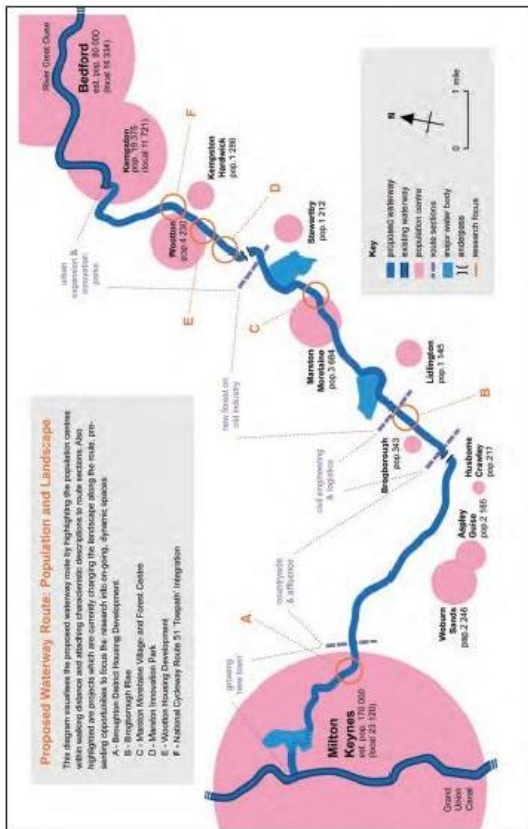
When do you expect your research to be completed?

This research is funded by the Engineering and Physical Sciences Research Council, who now strongly dictate a 3 year Ph.D. process. On that timescale I should have completed writing up by November 2014. It is at this point I will have analysed the data and be able to make conclusions and insights from the research findings. My hope is that the findings will be able to inform the work of design practitioners on future projects involving transvaluables. Also, that the research will provide valuable information and tools for the B&M Waterway project to promote a more sustainable infrastructure and help make the waterway reality.

Thank you Alex. Will you let us know your findings in due course?

Through observations of B&M Trust meetings and conversations with members I have come to several relevant findings. The consortium engages a range of technical experts who provide input to the many physical aspects of the waterways development, so professional knowledge of technology for environmental sustainability is available. Also, gaining participation with the project from public local to the proposed waterway route is an issue which is repeatedly raised. My research indicates that, according to 2007 Census figures, approximately 1.5 million people live within roughly 1 mile of the waterway, with 198,000 people living developments only increasing this number. It is important that local people understand the waterway project and are given a chance to influence its design and their local

Of course, I will let you know the research findings and path it takes. I will also be glad to have conversations about my research and the subjects it covers with those who are interested. Find me at future B&MK events or email me: alex.rowbotham@open.ac.uk



Appendix C: BMKW Consortium Developers Guide

Developers Guide, Page 1

A Brief Guide to Space, Design and Other Technical Issues in Providing for the Bedford Milton Keynes Waterway



Introduction

This guide has been produced to provide guidance on appropriate space, on design and on other technical issues in relation to provision for the Bedford Milton Keynes Waterway as required by the three planning authorities covering the route of the waterway.

A companion guide, 'A Brief Guide to the Value of Providing for the Bedford Milton Keynes Waterway in Development', introduces the Waterway and provides information on its value to developments along the route.

General Design Matters



The majority of the route will be an open aspect Waterway with a 15m minimum navigable channel and 1 in 3 sloping sides that are planted margins.

In cases where space is limited, visibility good and no obstructions, the width can be reduced (eg to 9m) for short distances in consultation with the Canal & River Trust.

These dimensions along with a 2m channel depth (1.5m water depth) and verge and multi-user, Equality Act compliant, towpath requirements suggest a minimum 35m overall corridor. See over for more details/illustrations.

However, in some sections and approaching bridges, locks and other structures, the traditional vertical hard sided canal construction may be required.

The minimum water width requirement is still as set out above for open aspect channel, reducing to 4.5m for locks and 6m for underpasses. See over for more details/illustrations.

There are a number of relevant standards and legal documents, including in particular:

- Code of Practice for works affecting British Waterways 2010 - engineering, design and construction manual. Contact Canal & River Trust at www.canalrivertrust.org.uk
- Flood & Water Management Act and Land Drainage Act. Contact Internal Drainage Board at www.idbs.org.uk
- Equality Act compliant multi-user foot-and-cycleway ie towpath (see the Environment Agency's Access for all design guide at www.environment-agency.gov.uk/research/library/publications/141756.aspx
- Town and Country Planning Association Policy Advice Note 'Inland Waterways'. See www.tcpa.org.uk/data/files/InlandWaterways.pdf



Access for Maintenance



Access for maintenance of the navigation is a particular requirement.

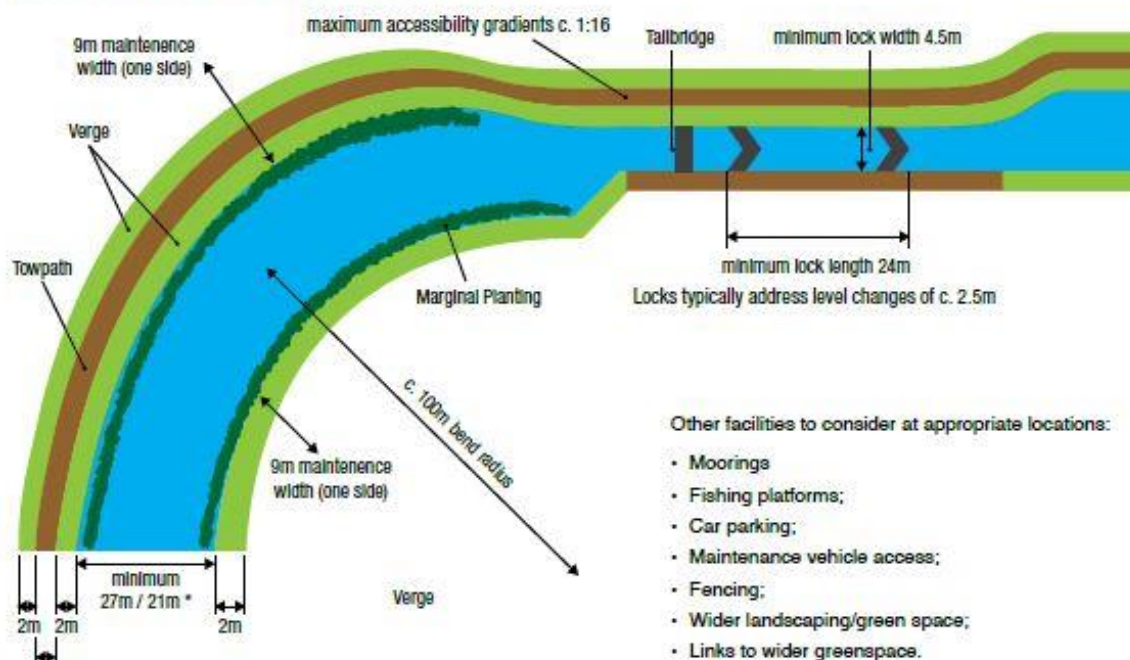
Machines capable of dredging a channel up to 15m wide are of necessity large – usually a 360 excavator.

As well as needing access routes to the waterside, the practicable space is a 9m wide access area either side of the water also ensuring that trees, structures and furniture do not obstruct operations.

Key Dimensional Data

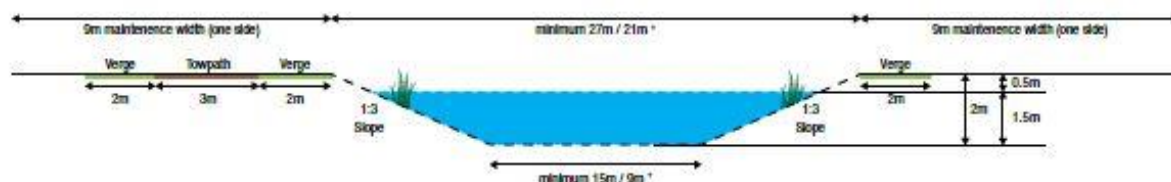
The following diagrams (not to scale) provide key indicative dimension data for the waterway itself and related facilities (including of channels, bends, towpaths, verges, locks, underpasses etc.)

1. Vertical Perspectives (widths, lengths, bends and facilities)



2. Elevations and Cross-Sections (widths, heights, depths)

• Open Aspect Waterway

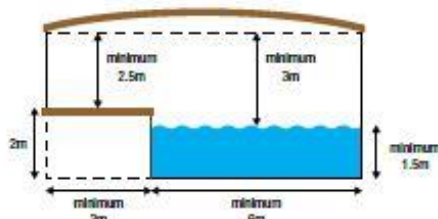


• Vertical Hard Sided Waterway

• Two boat Width Waterway



• One Boat Width Underpass



* Towpaths should be multi-user (footpaths and cycleways) and Equality Act compliant with surfacing appropriate to their location – see Equality Act reference above and Sustrans Technical Note 8 re surfacing:

[www.sustrans.org.uk/assets/files/design_and_construction/Technical_Note_8_-_Path_surfaces\(1\).pdf](http://www.sustrans.org.uk/assets/files/design_and_construction/Technical_Note_8_-_Path_surfaces(1).pdf)

+ The larger 'minimums' (27m and 15m at full depth) apply to unconstrained open aspect waterway sections. The lower 'minimums' (21m and 9m at full depth) can be applied to shorter (eg less than 500m) constrained sections with good visibility and no moorings.

A Brief Guide to the Value of Providing for the Bedford Milton Keynes Waterway in Development



Introduction

This guide has been produced to provide guidance on the value of talking advantage of provision for the Bedford Milton Keynes Waterway in the development of areas near, adjacent to or across the safeguarded route of the waterway.

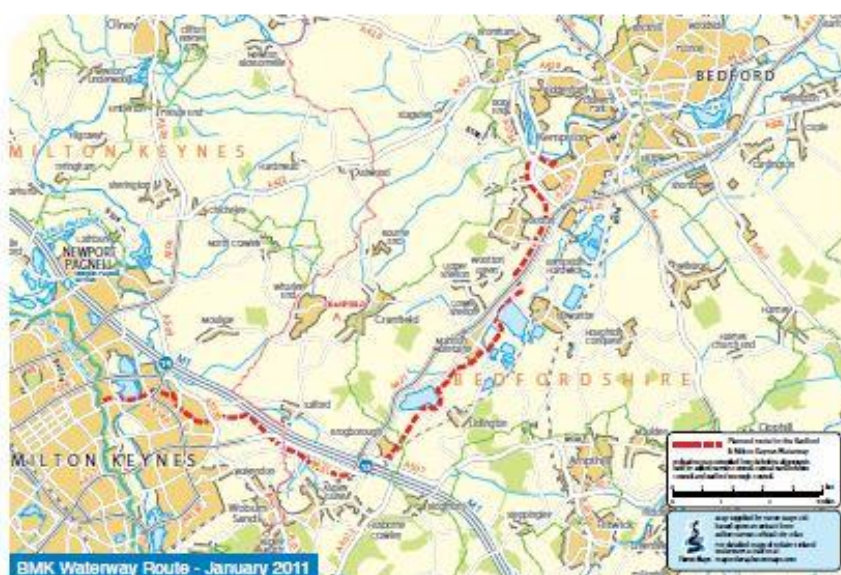
A companion guide, 'A Brief Guide to Space, Design and Other Technical Issues in Providing for the Bedford Milton Keynes Waterway', provides guidance on the provision of appropriate space, on design and on other technical issues in relation to provision of the waterway.

Background

The Bedford and Milton Keynes Waterway is a locally, regionally and nationally significant 'green-and-blue' infrastructure project that delivers a wide range of economic, tourism, recreational and place-shaping benefits. It will provide the missing link between the main UK canal network and the Fenland waterways and will accommodate broadbeam boats that can be up to 4.2m wide as well as traditional canal narrowboats.



Delivery of the waterway is led by the Bedford & Milton Keynes Waterway Consortium. The Consortium members are the three local authorities along the route – Bedford Borough Council, Central Bedfordshire Council and Milton Keynes Council, the two national navigation authorities – the Canal & River Trust (formerly British Waterways) and the Environment Agency, together with the Marston Vale Trust, the Parks Trust and the Bedford & Milton Keynes Waterway Trust.



The Waterway and its delivery is embedded in the core strategies of the three local authorities. The authorities are clear that the waterway is a priority and that it is their wish to work with developers along the route. The route map presented below is an illustrative map based on the route, more precisely set out in a series of safeguarding plans held by each of the local authorities for their area.

The local authority safeguarding maps indicating the route can be found at:
www.bmkwconsortium.org.uk/happen.htm

Developers Guide, page 4.

Roles and Value of the Waterway

Greenspace

All three local authorities recognise provision for the waterway as a contribution to the green infrastructure and open space obligations for each relevant development. There is intentionally no overall landscape plan for the route; this enables appropriate local landscape character to be developed in each area, for example, new woodland would be required within the Forest of Marston Vale. The waterway offers opportunities to deliver several green infrastructure objectives eg wildlife habitat creation, woodland planting and countryside network access and early discussion will enable the definition of an approach and style acceptable to the local authority and the Consortium.

Commercial Development

There is opportunity to provide or make provision for commercial facilities, services and attractions along the route. This is particularly relevant to employment sites or mixed use sites and a number of mechanisms are possible to introduce developers to potential occupiers. Some facilities, such as marinas, need to be optimally spaced by boat cruising time, but most do not. The Economic Impact Assessment of the waterway* estimates that between 50 and 90 businesses will set-up in or relocate to the new waterside locations; this could include providers of water related or water supporting activity as well as businesses just wishing to be in an attractive setting.



Surface Water Management

The Waterway can be designed to assist flood risk mitigation, and to provide attenuation and sustainable drainage. It could transport and dispose of surface water run-off into existing flood storage water bodies and water courses – Willen Lake and Broughton Brook in the west and Stewartby Lake and Elstow Brook in the east both direct flows into the River Great Ouse. Careful design will be required and early consultation with the local authorities in their role as Lead Local Flood Authority, and the Internal Drainage Boards, both as advisors to the LLFAs and with their Land Drainage Act responsibilities.



Property Value Uplift

many studies, both local and national, quantify uplift for both adjacent build and the wider area. While some might be viewed as optimistic, studies cluster around 18-20% uplift for waterside property and 8-10% for the hinterland up to a kilometre away, both values being higher than for greenspace alone. Generally, these studies consider the uplift to apply to residential, commercial and office employment sites and that industrial and distribution sites present challenges. However, it should be noted that the water related uplift applies only when the water is delivered, whether as a still water body or a navigable channel – a dry swale, ditch or allocation for future creation that does not deliver water misses the uplift opportunity.

Muck

The geology along the route is generally a thin layer of topsoil over Oxford clay - digging the channel can act as a borrow pit. Arisings can be used on-site or provided as a resource to other sites. Although the minimum water depth required is 1.5m and there are limiting issues with the cut profile, the cut may be deeper and provide additional material.

Ecosystem Services

With careful design, the Waterway could be used as a source of grey water and of cooling water, as well as water source heating, hydro-electric generation and other environmental uses.

Other Benefits*

The waterway also brings a range of other benefits that developers might consider indirect and, though not delivering for their site, are of great interest to local authorities and their wider communities, including:

- Economic development – £18-25m annual Gross Value Added to the local and regional economy once the waterway is operational;
- Job creation – 2,500 person years in the construction, significant numbers in tourism and the visitor economy as well as between 500 and 900 in businesses and other organisations attracted to re-locate to the area with an additional £35-70m annual GVA;
- Additions to the walking, cycling and horse riding network providing opportunities for exercise, health and well being; the towpath for part of the route will be redesignated as Sustrans NCN 51, moving the cycle route off-road.
- Place-shaping green infrastructure, iconic tourist attractions and space for events and festivals;
- And lastly, and most importantly, a navigable waterway.

Appendix D: Interview Guide for Trust Actors

Interview guide v3

14th March 2013

Interview Criteria:

- Semi-structured interview format, leading to good conversation.
- 5 or 6 topic with introductory sentence and sub-topic reminders
- Conducted in 45 minutes - 1 hour
- Audio recorded

Actors for Interview:

Actors representing different groups, backgrounds, stand points and power levels.

- B&MKW Trust , Chairman: Graham Mabutt – Strategic & political view
- B&MKW Trust , Director: Hilary Goldsmith – Marketing exec, pro-public engagement
- B&MKW Trust , Director: Drew Merchant – Project management, connected, political.
- B&MKW Consortium, Secretary: Paul Vann – Beds LA Economic Dev. Manager
- B&MKW Consortium, Civil Engineering member: Paul Williams, Halcrow.
- Canal & River Trust: James Clifton, Enterprise Manager – strong support
- Planning/Urban Design: Simon Collier, David Lock Associates – local supporter, future business
- Internal Drainage Board – powerful actor group
 - Beds and River Ivel
 - Bucks & River Ouzel
- Marston Vale Forest Centre, Chief Exec: Tony Talbot – Land owner, vested interest

Interview Content:

Thank for time given and acknowledge persons role.

Introduction to interview: guided conversation, about an hour.

Confirm that read information sheet and provided consent form.

Start audio recording and explain content at start.

1. So how did you get involved with the Bedford & Milton Keynes Waterway?
2. A current plan for the waterway exists, as represented in the 'A-Z guide', and this plan has changed over time.
 - a. How has this plan come into being?
 - b. Who has been involved in designing the waterway?

3. It is acknowledged that the waterway will take a long time to complete, with a pragmatic estimation of around 20 years to completion.
 - a. How do you think the present design of the B&MK waterway will stand up over time?
 - b. Do you think our use of waterways might change into the future?
4. One of the tag lines for the waterway is 'A Waterway for All'.
 - a. What does that mean in relation to 'sustainability'?
 - b. What do you understand as the meaning of sustainability?
5. The proposed waterway is a complicated and expensive thing to create.
 - a. Why should we do it?
 - b. What problems do you foresee with the proposed waterway?
 - c. Can you see solutions to these problems?
6. Given all that we have talked about...
 - a. Who do you think are the people or groups important to the development of the waterway? (supportive and unsupportive)
 - b. Who else should I interview in order to gain a complete picture?
 - i. Can you recommend a personal contact?
7. The preferred route chosen for the waterway passes very close to several communities.
 - a. How have the people who live near this route been engaged regarding the waterway?
 - b. How has support for the waterway been generated within the wider public?

Extra issues... THANKS

* How have designs been communicated, to experts and public (visuals, maps, illustrations, models,...)

* Publics socially constructed understanding of what a waterway is (canal/waterway/waterway park)

* Planning: role of planners and public participation

Notes

1. Provide details on the creation of the waterway proposal, where design and planning have taken place, and who has been involved in the process.
 2. Understand perceptions of the future, if this has been considered before, if related issues have been incorporated into existing design and introducing the possibility that they should be. Leads into the sustainability issue.
 3. Assess engagement with, and understanding of, the issue of sustainability, and if the waterway has been considered from this perspective.
 4. Examine the social construction of the waterway. Utilising the techniques of Bijker (1995). focus on the problems and solutions.
 5. Again utilising Bijker (1995) technique of 'snow balling' to identify relevant social groups for this research.
 6. Assess what has been done to engage with the public and promote their participation with the waterway project, which can then be examined for any design related activities.
-
- * Content is listed by number for general topic, which includes introduction sentence and initial question. Sub-questions of that topic have a letter I.D., and could be used depending on how and where the interview goes.
 - * The order of the topics and questions should help the discussion lead onto the next topic.
 - * The choice of questions should be influenced by the actor participating in the interview, as they may have more or less to contribute by question. Questions relating to the participants area of specialism could be expanded with follow on questions.
 - * A pilot should be undertaken of interview, to understand what works and if help develop interview.

Appendix E: Flexible Template

Design

- D1. Control of the waterway design process
- D2. Designing waterway through defining its route
- D3. Design for multiple uses
- D4. Design can use new and innovative technologies and solutions
- D5. Design visions based on possible new futures
- D6. Design visions based on existing infrastructure paradigm
- D7. Design visions based on solutions to technical problems
- D8. Design communications suitable for public
- D9. Design visuals communicating to experts
- D10. Design detail developing where land development occurs on route
- D11. Design seen as activity undertaken by technical experts
- D12. Design influenced by local community
- D13. Design activity focusing on blue infrastructure
- D14. Design changes made to achieve a better outcome
- D15. Design process exploratory and responsive (Link to PF3)

Requirements

- R1. Waterway project only worthwhile if green infrastructure benefits are realised
- R2. Waterway design needs to support a wide range of actor groups and their activities
- R3. Waterway must benefit local communities
- R4. Waterway design to be resilient to future changes
- R5. Water management to safe guard from flood risk
- R6. Requirements for water bodies
- R7. Desirable actions driven by legal requirements
- R8. Mutual benefit to actor groups (Link to Actors)
- R9. Prioritising economic benefits of infrastructure (Link to Opportunities)
- R10. Waterway standalone section must provide useful benefits
- R11. Need designs that communicate the Waterway Park vision
- R12. Waterway needs to be written into local authority plans
- R13. Waterway sections need planning permission for project progress
- R14. Waterway character to reflect local community (Link to Situatedness)
- R15. Innovative use of appropriate technologies

- R16. Identify areas with greatest potential for Waterway Park green infrastructure
- R17. Communities along waterway value it because they are connected to it (Link to Actors & Participation)
- R18. Need design visuals which communicate imagined futures (Link to Design)
- R19. Waterway retains coherent character

Sustainability

- SU1. Awareness of sustainability issues
- SU2. Awareness of sustainability impacts from waterway use
- SU3. Awareness of sustainability impacts from waterway construction
- SU4. Taking action for the common good
- SU5. Sustainability seen as addressing environmental agenda only

Opportunities

- B1. Recognition of problems around funding
- B2. Recognition of problems around technical land issues
- B3. Recognition of problems around environmental management
- B4. Problems created by unexpected consequences
- B5. Legislation as barrier to infrastructure construction
- B6. Conflict between actor groups (Link to Actors)
- B7. Negative perceptions of change from local actor groups/public (Link to Actors)
- B8. Negative perception of change from expert actor group (Link to Actors)
- B9. Negative perceptions of volunteer led actions
- B10. Miss-conceptions of technical area issues
- B11. Not enough volunteers with the right skills
- B12. Being constrained by historical canal network precedents
- B13. Difficulty in quantifying the benefits of a waterway
- E1. Recognition of the potential benefits of the waterway project
- E2. Potential benefits only realised on completion of whole infrastructure
- E3. Support for waterway project
- E4. Political support of waterway is driven by public support
- E5. Waterway project gaining acknowledgement of credibility and viability
- E6. Identifying waterway route sections to aid discussion and project management
- E7. Identifying roles for actor groups and organisations
- E8. Justification for waterway to be built

- E9. Focusing communication to persuade and gain project support
- E10. Using the environment to regenerate an area
- E11. Recognition of the benefits of the Waterway Park green infrastructure
- E12. Using the historical concept of creating a canal here
- E13. Timescale of project allows design to respond to socio-technical change

Agency

- A1. Expert actor group controlling and enforcing
- A2. Expert actors desire for technical design detail
- A3. Actor groups fulfilling multiple roles within project
- A4. Ownership of land and influence over activities therein
- A5. Expert actor groups enabled by legislation
- A6. Volunteer actors contributing to project
- A7. Consortium actor groups supporting and defending waterway plans
- A8. Expert actor groups not fulfilling expected roles
- A9. Actor groups project support influenced by their leaders

Pragmatism and Flexibility

- PF1. Trust taking pragmatic approach to focus of activities
- PF2. Infrastructure completed in partial sections over time
- PF3. Opportunistic and flexible approach to waterway design/construction needed to take advantage of opportunities
- PF4. Infrastructure construction progressing through development of route land
- PF5. Exploiting planning policy to gain infrastructure funding
- PF6. Adoption of Waterway Park project name as deliberate positive step
- PF7. Project activity focused on technical challenges
- PF8. Not designing project details that could change before construction
- PF9. Main project priority securing a waterway route across land (Link to Requirements)

Participation

- PR1. Public engagement around waterway route
- PR2. Public engagement with outline waterway designs
- PR3. Political agenda to actor group engagement

- PR4. Lack of participation in design process
- PR5. Public participation seen as undesirable
- PR6. Organising participation of formal project actors
- PR7. Lack of public participation in project
- PR8. Gaining formal participation of expert actor groups

Situatedness

- ST1. Situating the waterway design in its locality
- ST2. Infrastructure as man-made system existing over long periods of time
- ST3. Waterway impacting its own regional context
- ST4. Future local communities invested in and care for waterway

Appendix F: Waterway Park Criteria

Listing of all the elements identified in the brainstorming exercise of Workshop 1 to develop a Waterway Park Criteria. The elements are grouped by themes identified through post workshop clustering analysis. The elements have been recreated exactly from written records, with the addition of author comments in [square brackets] where appropriate for clarification.

Movement

Lots of good access

Not acting as barrier

Bridges across water [not just legal minimum]

Routes to enable travel

Reduce towpath conflict [between different users engaging in different activities in same space, as this is presently big issue on canal network]

water access [provide lots of access points to the water to enable as many activities and groups as possible]

Functionality

Provide adequate car parking [so that people will be able to visit it]

Boat hire

Cycle hire

Small scale energy generation opportunities demonstrated along the route -e.g. hydro, solar, vertical axis wind - forward looking

Water supply - may need to design in reservoirs and for flood storage (positive design opportunity) - or linking to existing water bodies

Demo Park to show potential [develop one section to show full potential of Waterway Park vision]

Showcasing existing engineering features, e.g. Brogborough

Connectivity

Linking activity [that already takes place around it]

Linkages & connectivity into other networks - appropriate to scale

Allows people to enjoy the full scale of infrastructure

Mapping activity and complimenting [find out what is currently happening in the waterway areas and design to include and compliment]

Related positively to development / transport infrastructures - which faces rather than excludes the waterway

Links to public transport networks [avoid use of the waterway park being car specific or greatly increasing car traffic]

Activities

Complimentary to existing leisure & recreation assets in the Marston Vale - links & connects

Fishing for all

Flying kites

Horse riding

Cycling

Walking

Angling

Wild swimming [Allow people to do this without danger and causing confrontation with other users]

Ecological

School links and environments

Could include off line flood storage areas for surface water management across the Marston Vale - to create a variety of different environments

Kingfishers

Ecological Corridor

Providing a green corridor

Provide nature reserves

Space

Expansion room [allowing growth of park reflecting use and success]

LAND [waterway park requires access to and modification of more

Safe guarding [ensure land around waterway required to realise waterway park is not acquired for a different use and consequently limiting potential]

A major piece of infrastructure which needs land! - should the consortium be looking at land assembly - not focusing on the land along the route itself, which is well safeguarded, but on land along the route that will be the major green hubs.

Varying size

Not uniformity

Wider bits

Landscape diversity

Strategy

More convincing vision

Project name change [maybe should be considered if extra goals to be recognised and achieved]

Designed to be innovative and forward looking - bold and visionary

Waterway park meets infrastructure requirements

Convince politicians [provide arguments that...]

Build relevant to time [what is suitable to present time, i.e. Brogborough solution last]

Speaking like a planner [To encourage support from LA's planning Waterway Park needs presenting using language and documentation they are familiar with understand]

Need SPD or similar? [Supplementary Planning Documents (SPD) provide detailed guidance on how planning policy will be implemented]

Own policy document [Does waterway park need it's own policy document within LA's control? E.g. SPD]

Prioritise waterway infrastructure for funding [Ensure this is facilitated through inclusion within s106 and CIL strategies]

Place

Urban park as well [Not just emphasis on green bits but maximise the interaction of waterway with its surroundings through built-environment]

Distinctiveness - range of different spaces

The backbone of a 'skeleton' that broadens out to take in new and existing spaces and rarities - web of connectivity with waterway at the centre

Enables positive change to place

Distinctive place

Help transform [surrounding area and places]

Aesthetics

Attractive' - environmental - to transform the perception of Marston Vale - attracting, leisure, residential, commercial

Viewing areas

Variety

Creativity

Destination awareness [needs effective communication and marketing to pull in users and guide them around park]

Railway poster style 'Waterway Park' [suitable marketing material]

Room for play

Room for the unexpected

Public Art

Space for public art - a coherent treatment across the whole site with some key features (e.g. helix sculptures)

Positively designed, even in constrained sections, e.g. through use of public art

Informal recreation [allows for people to do their thing, unexpected and uncontrolled]

Socialising

Design out problems [esp. conflict between users]

Reduce conflict [between users and activities within waterway park]

Explicitly designed for public health & wellbeing - interpretation - benches - green gym/blue gym - electronic facilities (distance/time/calories/etc.) - water based activities (canoeing/paddle boarding/etc.)

Designed for all user groups, but to ensure it is special and valued for all the individual users

Open access not just clubs [Ensure you don't have to be part of an exclusive club in order to access or use]

Allow for picnics

Enables healthy activity

Considerate people

Enabling community links

Connected to local communities - especially in the MK section - Can we get communities involved in the design of 'their' sections?

Works for a range of users - including, but not exclusively, boaters

Full disabled/mobility access for all users

Economic

Don't need licences [free and open to all. Not income dependent]

Free waterway [Don't limit access and use through charges]

FREE (everything)

Enabling business links

Waterside businesses: Cafes, Bars, Hotels

Link into local development

Economic Links

A demonstrable economic magnet

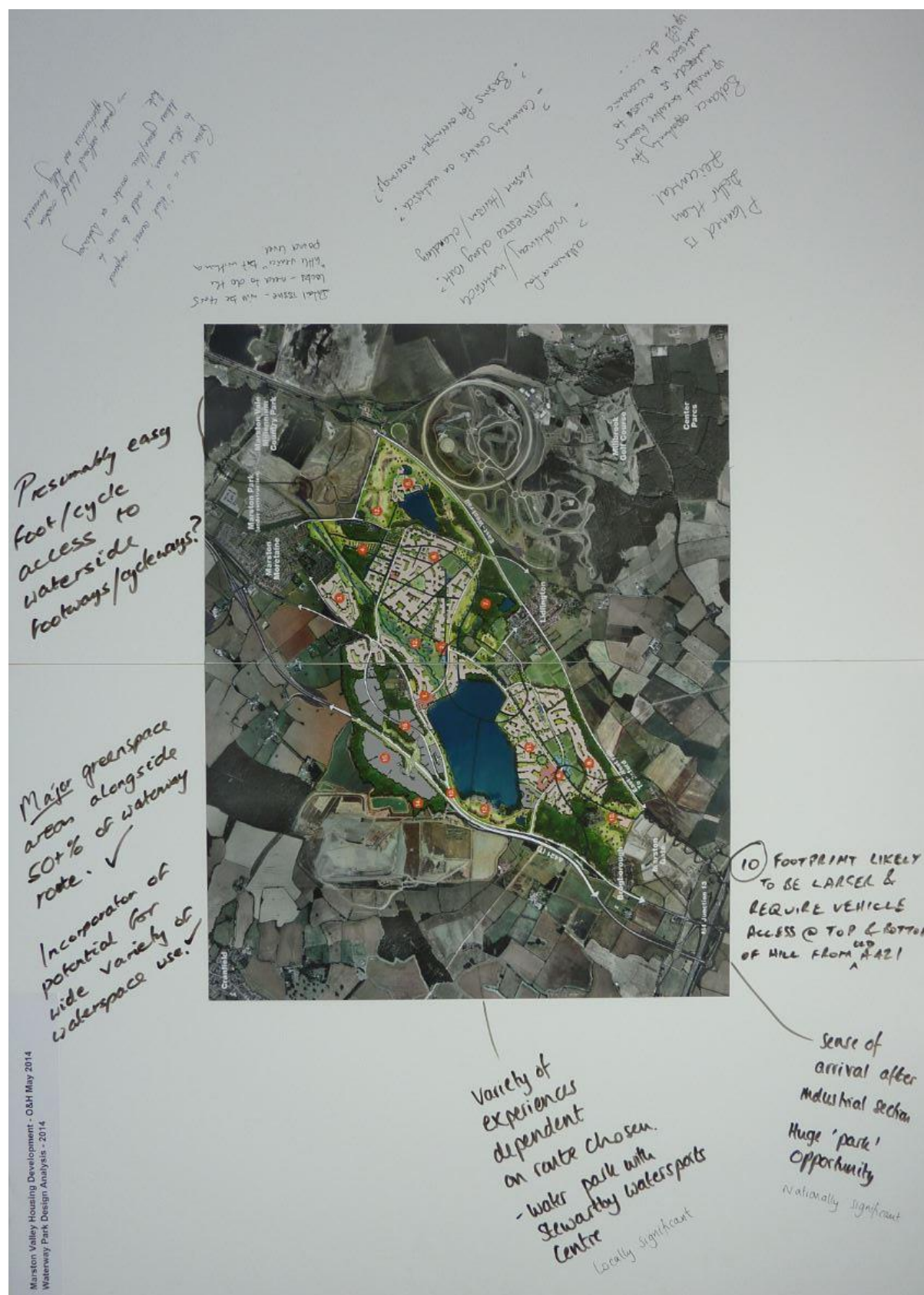
Marinas - self determine [necessary facility which is expected to develop as economic opportunities develop and are exploited]

Appendix G: Design Workshop 2 - Display Boards

Milton Keynes Waterway Park – BMKW Trust, 2007

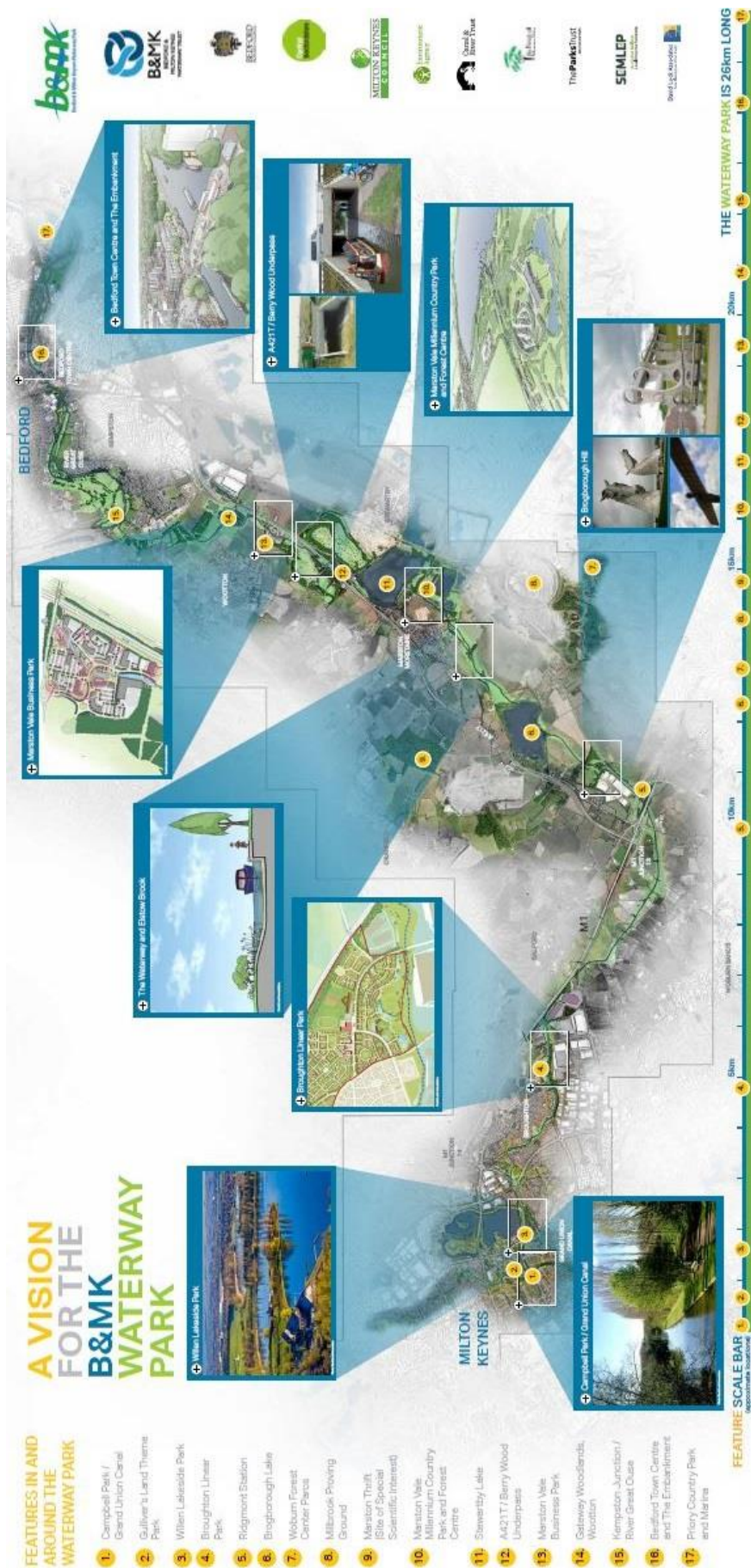


Marston Valley Housing Development – O&H Developments, May 2014



[illegible]

Appendix H: Waterway Park Vision document (2 sides)



THE WATERWAY PARK

The Park is designed to be centred around a waterway and will drive forward environmentally led regeneration for the area.

We can design a canal for a variety of uses at the outset, rather than trying to squeeze a variety of uses into a space designed 200 years ago for freight. We have a unique opportunity to apply blue ideas thinking to the development of waterways for the future.

The B&MK Waterway Park will be a prime example of the best in 21st century engineering, landscape and design - a truly sustainable development.

The project will connect the Grand Union Canal at Milton Keynes with the River Great Ouse at Bedford, creating Britain's first major waterway in a century and providing a cross-country link that connects east and west, opens up the Marston Vale region, and provides wide ranging amenities and opportunities for communities in the rapidly-growing South-East Midlands area.

© 2007 Blackwell Publishing Ltd, *Journal of Internal Medicine* 262: 399–407

Tourism and Recreation

Estimated Visitors to the Water

Up to 85,000 visitors a day

Fishbase Extended Data

£££££
Opto
£4 million

एनएसए

Boating and Boating Expenditure

7,200 host

movement
£532,000

spend a
year

S

 Hire Boat Usage

Hire					+£559,300
boat					

usage

+10%
H
33

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Linking
 85km² of
 woodland
 and trees =
 1 million
 trees

20km² of Greenspace
 directly connected by
 the B&MKWP route

• Year 1

New Homes

+

Up to 250,000 new homes over the next 20 years

BENEFITS OF THE WATERWAY PARK

- Providing the catalyst for environmentally-led regeneration along the Watway
- Park routes between Milton Keynes and Bedford.
- Creating a nationally significant leisure and tourism destination.
- Opening up a wide range of recreation opportunities, focusing on healthy lifestyles, walking, cycling and water based recreation and sport.
- Expanding the economy, bringing in visitors and new jobs related to leisure and tourism.
- Creating the first new watway for 100 years with significant opportunities for technological innovation and development.
- Increasing biodiversity by joining major wetland sites, creating new habitats and parkland at a sub-regional level.
- Bringing benefits to regional water management through improved water storage and transfer, flood risk management and drainage at a regional level.
- Creating a vital link in the anglian regional watway network and linking the national watway network from the Severn to the Wash.

Find out more and get involved at:
www.h-mkwaterway.org.uk

www.b-mkwaterway.org.uk

For more information, contact your local distributor or call 1-800-368-5272.

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